

THE UCITA DEBATE

Vendor and user representatives face off on the default rules for software deals. Page 34

ALIGNING MARRIOTT

In three years, the hotel chain has made strides in aligning its IT group with business objectives. Page 58

BLASTING BARRIERS

Common bottlenecks can bring your e-commerce site to a near standstill. Here's how to fix them. Page 84

COMPUTERWORLD

THE NEWSPAPER FOR IT LEADERS • WWW.COMPUTERWORLD.COM

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BRICKS 'N' CLICKS
WEATHER STORM

Dot-com woes aren't affecting hybrid retailers

BY JULIA KING, CAROL SLIWA
AND CRAIG STEDMAN

Financial difficulties have hit several high-profile Internet-only retailers in recent weeks.

But their misfortunes are doing little to slow down or alter e-commerce efforts at many of their counterparts with catalog and brick-and-mortar operations, not to mention business-to-business marketplace plans.

Coldwater Creek Inc. is a prime example. Last week, the Sandpoint, Idaho-based retail-

er of women's clothing said it has no plans to slow down development of its online business, even as Peapod Inc., CD-now Inc. and Value America Inc. have disclosed money problems and staff cutbacks and suffered declining stock prices.

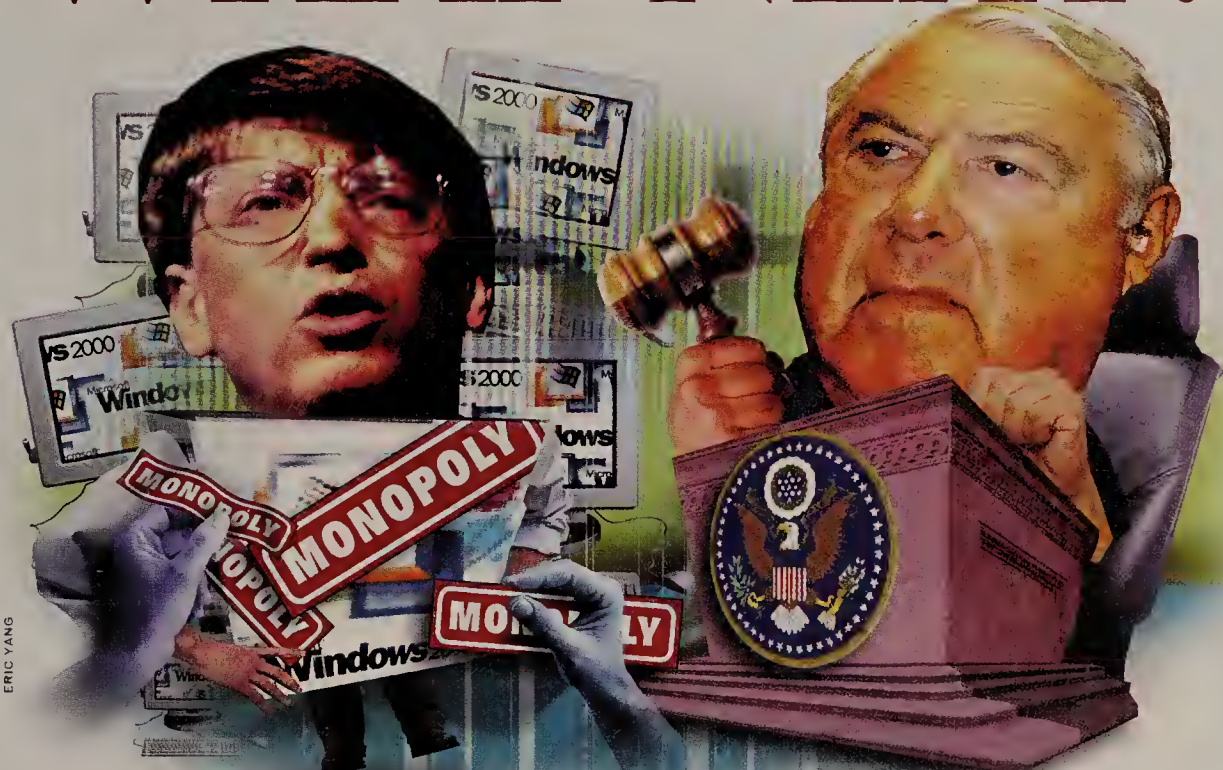
Coldwater Creek's e-commerce site is already making money, with profit margins in the high single digits — a percentage similar to what its flagship catalog business makes.

"I think our [multichannel] concept is proving to be correct. We're looking at it and saying, 'This makes money,'" said Dennis Pence, head of Internet sales at Coldwater Creek.

Next year, Pence said, he expects
Hybrid Retailers, page 109

DOT-COM
CASH CRUNCH

WHAT NEXT?

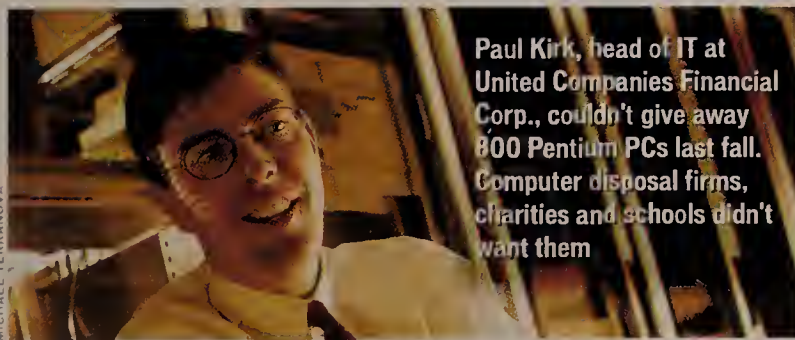


ERIC YANG

COMPUTER JUNK

AS COMPANIES UPGRADE THEIR HARDWARE every three years or so, they're struggling with the problem of how to get rid of thousands of obsolete computers that nobody — even charities — wants. Recyclers mine some of the computer trash for gold, but some of it winds up as toxic waste in landfills, as Kim S. Nash reports. An exclusive *Computerworld* survey found that most companies don't have disposal plans — and it's costing them money.

Story is on page 20.



Paul Kirk, head of IT at United Companies Financial Corp., couldn't give away 800 Pentium PCs last fall. Computer disposal firms, charities and schools didn't want them.

Users Question
Impact of Trial
And Remedies

*Poll shows few want
Microsoft broken up*

BY PATRICK THIBODEAU,
KIM S. NASH AND MATT HAMBLIN

The verdict is out: Microsoft Corp. has broken the law. And it's now up to Judge Thomas Penfield Jackson to determine what punishment or remedy will remove Microsoft's "oppressive thumb" from the competitive process, starting with a hearing on May 24.

But because the industry moves so fast, corporate users remain skeptical about the antitrust trial's ultimate impact.

"By the time it is resolved, the industry will have moved on to a different model, and

Users, page 14

Which one of the following remedies should Judge Jackson impose?

Continued oversight of Microsoft's business operations **51%**

Court-ordered restrictions on Microsoft's behavior **29%**

Breakup of Microsoft **17%**

A large fine **14%**

Survey base: 132 IT professionals; multiple responses allowed

■ **More on the Microsoft verdict and its stock market impact, pages 12, 14, 15, 16, 32 and 107**

Guilty Verdict
Could Boost
Linux Fortunes

*OS may be easier sell
to top management now*

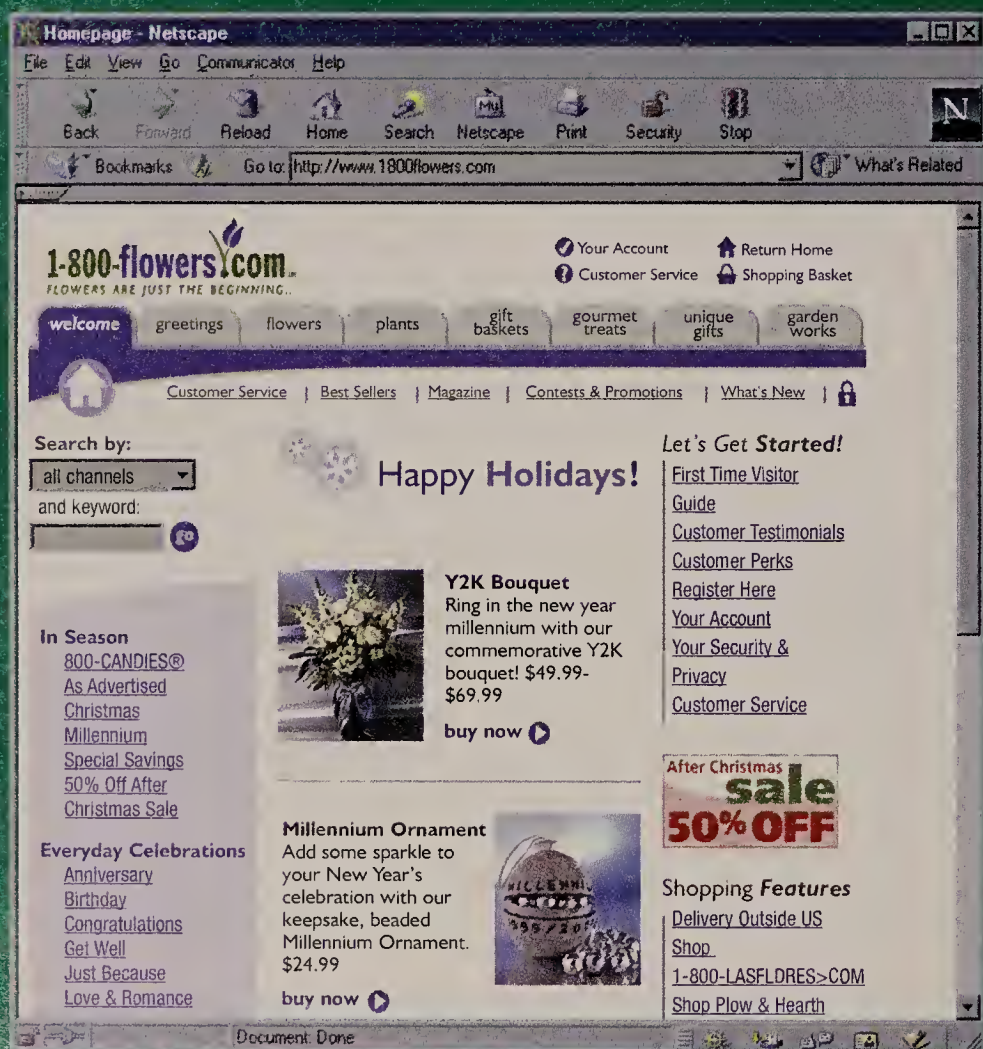
BY DOMINIQUE DECKMYN

With Microsoft Corp.'s future dominance of the software industry more than ever in doubt, some users are more willing to look at alternatives. Such as Linux.

An exclusive *Computerworld* poll found that 11% of corporations surveyed were more likely to consider other operating systems because of last week's verdict. Linux overwhelmingly was the alternative operating system mentioned most often, with 73% of the vote (see chart, page 16).

"In the future, it will be easier
Linux Fortunes, page 16

Unicenter Helps 1-800-FLOWERS.COM Blossom.



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GLOBAL ASPIRATIONS, LOCAL PROBLEMS

As companies implement global IT systems, their managers are learning that, in everything from e-commerce to ERP applications, they can't overlook regional idiosyncracies. Page 88



DO COMMUNITIES PAY?

Trying to exploit an online community for money is the quickest way to kill it. But they can pay off in other ways, says gURL.com's Heather McDonald and iTurf's Oliver Sharp. Page 50

COMPUTERWORLD THIS WEEK

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- 6 ARIBA TEAMS UP** with Bank of America to form a massive business-to-business online marketplace.
- 8 CARRIER EXTENDS** wireless tracking service via cell phones to customers to keep tabs on overseas status.
- 10 BMC SOFTWARE PUTS** its money where its mouth is: a guarantee to meet deadline or a 20% refund.
- 12 BROKERAGES FEAR** online outages, capacity problems, survey finds.
- 24 SHIPPERS WANT** better online tracking, ordering and payment capabilities from transportation companies, a KPMG study shows.
- 24 GOVERNMENT ALLOWS** strong encryption as security fears grow.
- 26 7-ELEVEN ATMS LET** customers shop online, cash checks and buy money orders.
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- THE MICROSOFT RULING**
- 32 MARK HALL** says the courts should take it easy on the software giant, as long as the company is told that any future transgressions will be dealt with more harshly.
- 32 DAVID MOSCHELLA** says there are no winners in the antitrust case.

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- HACK OF THE MONTH**
- 75 CREDIT-CARD THEFT** hasn't received as much recent attention as denial-of-service attacks, but it may be a more pervasive threat to e-commerce.
- SECURITY JOURNAL**
- 76 PAT ESCAPES** serious damage as his company is hit by its first e-mail virus. Then he's off to a security class.
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- 84 BOTTLENECKS SLOW** down e-commerce sites, but there are ways to banish them.

Hire the best
and the brightest
— a kind of
mini-keiretsu —
then get out of
their way.

FRANK GETMAN, PRESIDENT OF HOUSTON STREET EXCHANGE, ON THE INTENT BEHIND A PLAN UNDER WHICH HE PARTNERED WITH FOUR VENDORS WHO BUILT AND PUBLICIZED AN ELECTRICITY EXCHANGE WITH LITTLE OR NO SUPERVISION FROM HIM. SEE PAGE 40

- 33 ALLAN E. ALTER** writes that a "theory-doing gap" is restraining the potential of knowledge management.
- UCITA FACE-OFF**
- 34 J. DOUGLAS KOELEMAY** says the Uniform Computer Information Transactions Act (UCITA) offers clear guidelines for software deals. . .
- 34 . . . BUT JOHN F. RUDIN** says the proposed law is heavily

slanted in favor of software vendors.

- 48 PETER G. W. KEEN** is totally serious: Large-scale software is being delivered on time and under budget, and IT must be ready.
- 110 FRANK HAYES** examines what some pundits have said and comes to one conclusion: They're slicing and dicing a load of baloney.

AT DEADLINE

Too Many H-1B Visas

An audit that McLean, Va.-based KPMG Consulting LLC completed last month found that the U.S. Immigration and Naturalization Service (INS) issued between 21,888 and 23,385 too many H-1B visas last year. Congress had set the high-tech visa limit at 115,000 and is considering legislation that would erase the overage or apply it to this year's allotment. The INS attributes the error to a systems problem.

CTP Sues Founder

Cambridge Technology Partners Inc. last week sued its founder, James Sims, claiming he violated a one-year noncompetitive clause and raided the Cambridge, Mass.-based company for employees. Sims founded Boston-based Gen3 Partners Inc. in December, six months after quitting as CEO of Cambridge Technology. Sims admitted he hired 17 employees from his former company but dismissed the suit as being "completely without merit."

Dell/Airline Deal

Dell Computer Corp. in Round Rock, Texas, just found 100,000 ready-made customers after signing a deal with American Airlines to provide discounted computers and Internet access for American's workforce. The \$15 million contract will allow employees of the airline to buy computers with bundled computer services at below-market rates, giving Dell access to American's sizable job pool.

Short Takes

AT&T CORP. last week signed a \$1 billion, seven-year outsourcing agreement to turn over certain information technology operations to El Segundo, Calif.-based **COMPUTER SCIENCES CORP.** as a cost-cutting move. . . . **NORTEL NETWORKS CORP.** in Brampton, Ontario, has signed a deal with **PRICEWATERHOUSECOOPERS** to provide the New York-based firm with business services such as payroll, accounts payable, employee training and employee expense reimbursement. . . . A software glitch last week temporarily knocked out e-mail service for 2,000 users of **NETSCAPE COMMUNICATIONS CORP.**'s WebMail service.

Nationwide Wireless Prospects Improve

Consolidation of carriers raises hopes for coast-to-coast coverage; obstacles remain

BY BOB BREWIN

THE FRAGMENTED U.S. wireless communications industry is in the midst of a large-scale, much-needed consolidation, according to analysts and corporate users, who say they hope the new national megacarriers can deliver improved and truly nationwide wireless voice and data services.

Last week, BellSouth Corp. in Atlanta and SBC Communications Inc. in San Antonio announced plans to combine their wireless operations, forming the country's second-largest wireless carrier. Customer service, nationwide roaming and flat-rate pricing for heavy users were key factors in the decision, according to company officials.

The development came a week after formal government approval of a joint venture between New York-based Bell Atlantic Corp. and London-

based Vodafone AirTouch PLC, making it the largest wireless carrier in the U.S. (see chart).

Keith Pagluch, a vice president at Sprint PCS Group in Kansas City, Mo., said he views the consolidation in the industry as inevitable, given customer demands. Sprint PCS bills itself as the only true national wireless carrier.

"We have always subscribed to the idea that the best way to be in this business is to be a nationwide carrier," Pagluch said. "Customers want to go anywhere and use the network as if they were at home."

Improved Coverage to Come

Alan Reiter, an analyst at Wireless Internet & Mobile Computing in Chevy Chase, Md., said that although the integration of regional networks such as those controlled by BellSouth/SBC and Bell Atlantic/Vodafone does undoubtedly improve coverage, that doesn't happen overnight.

Top Wireless Carriers

	SUBSCRIBERS (MILLIONS)	POPULATION* (MILLIONS)
Bell Atlantic/Vodafone	24.0	232.0
BellSouth/SBC	16.2	175.0
AT&T Wireless	12.2	253.0
Sprint PCS	5.9	290.0
Nextel	4.5	N/A
Voicestream Wireless	2.2	220.0

*In service areas

"These companies are going to have to spend a lot of time and effort integrating systems such as customer support and billing," Reiter said.

The wireless carriers also need economies of scale to bid on and then build next-generation wireless systems, the cost of which will amount to billions of dollars, Reiter said. He cited the fight for spectrum in the U.K., which pushed bids for next-generation bandwidth to \$22.6 billion last week (see story below).

Douglas Caffrey Fields, vice

president of telecommunications at United Parcel Service of America Inc. in Atlanta, welcomed the new wireless joint ventures.

The consolidation will result "in some large-mass carriers that have the capability to compete with one another, and generally I think that's good for the subscriber," he said.

Despite the promise of future "seamless" services touted by the architects of these joint ventures, some corporate users remain skeptical.

Kevin Loveless, president of Global Travel in Boise,

Idaho, said that from his perspective, the go-anywhere wireless service won't be a reality until carriers in the U.S. adopt standards that are used by the rest of the world.

"Without standards, it seems to me, there is a potential I still have to deal with different services," Loveless said. "I want a world phone." ■

MORE ONLINE

For Computerworld coverage of wireless carriers and links to related Web pages, visit our Web site.

www.computerworld.com/more

Wireless Spectrum Bids Top \$22B in U.K.

Analysts, users now worry about U.S. auction prices

BY BOB BREWIN
AND DOUGLAS F. GRAY

Bids for rights to the airspace for broadband wireless services in the U.K. topped \$22 billion last week, raising concerns among analysts and potential corporate users that bids for U.S. wireless frequency will be even more out of control in the upcoming auction next month. They fear users will get stuck with the hefty bill.

Such staggering prices for a commodity that governments once gave away also serves as a strong argument for the creation of national U.S. mega-

AT A GLANCE

U.K. Spectrum Auction

- Up for grabs: broadband, countrywide licenses for spectrum capable of supporting advanced wireless applications, including video, music and wired Web-like graphics
- Combined bid totals jumped from \$16B to \$22.6B in one week
- Bidding, in its 106th round, will continue until all but five bidders drop out
- Vodafone AirTouch, with a bid of \$5.7B, and MCI WorldCom partnered with British Telecommunications, with a bid of \$4.3B, lead the pack

carriers with deep corporate resources, analysts said. Brent Ostergaard, a Denmark-based analyst at Giga Information Group Inc., said the U.K. spec-

trum price war has reached the point where it has become "absurd. . . . By having this future revenue stream going from industry into the government, you're really taxing future users of these systems."

Douglas Caffrey Fields, vice president of the telecommunications unit at United Parcel Service of America Inc. in Atlanta — the single largest cellular telecommunications user in the U.S. — said he believes the carriers may have priced themselves out of the market with such a bidding strategy for raw spectrum. UPS uses its extensive global telecommunications network to support its core business, delivery of what Fields described as "low-margin" ground packages.

Looking at the auction

prices in the U.K., Fields said that at those prices, "we can't get into broadband wireless data. . . . We just can't afford it."

Alan Reiter, an analyst at Chevy Chase, Md.-based Wireless Internet & Mobile Computing, said the U.K. spectrum auction provides a definite economic justification for the BellSouth Corp. and SBC Communications Inc. joint venture announced last week and the similar Bell Atlantic Corp./Vodafone AirTouch PLC joint venture (see story above).

"To pay for spectrum, you're going to need a huge company," Reiter said, adding that these U.S. joint ventures may have been formed partly to provide the financial muscle needed to join in and survive the rich U.S. spectrum auction. ■

Gray reported on this story from the IDG News Service bureau in London.

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Top U.S. Bank to Open B-to-B Marketplace

Target: Small-business vertical markets

BY MARIA TROMBLY

The largest bank in the U.S., Bank of America Corp., has joined forces with Ariba Inc. in Mountain View, Calif., to create a business-to-business online marketplace that could be involved with as many as one quarter of all business payments in the country.

Officials from both companies announced last week that they expect the new marketplace to serve Bank of America's 2 million business customers. To administer the marketplace, Bank of America will form a new subsidiary, Banc of America Marketplace LLC.

The Charlotte, N.C.-based bank is currently involved with about a quarter of all payments made in the U.S., according to George Bicher, an analyst at Deutsche Banc Alex. Brown Inc. in Baltimore.

"That fact, together with the fact that they have one of the largest corporate relationship lists in the country, provides a lot of the flow around which a business-to-business enterprise can be crafted," he said.

Jim Dickson, head of Bank of America.com, said the exchange will target the bank's 1.6 million small-business customers in key vertical markets such as retailing when it launches in about 18 months.

"We'll go market by market

and create vertical marketplaces," Dickson said, adding that vertical integration would make the marketplaces more compelling for small businesses and other clients.

"This has a potential for phenomenal growth," said Kenneth D. Lewis, president and chief operating officer of Bank of America.

"Business customers will have access to faster, easier and more efficient ways to

buy and sell goods over the Internet," Lewis said. "Our customers will be able to automate the procurement process. And it gives minority suppliers broader access to markets."

New Revenue Opportunities

Lewis wouldn't say how much the project is expected to cost or earn the company, but he did say the online marketplace gives the bank additional revenue capabilities.

He said customers would do more of their financial busi-

ness with the bank, and the bank would gain from the efficiencies of customers being online.

The bank might also expand its business relationships down the supply chain, said Deutsche Banc Alex. Brown's Bicher.

Bicher wouldn't speculate about whether the new alliance would stifle competition between business-to-business exchanges, but he did point out that it puts additional pressure on traditional middlemen.

"You basically have end users going directly to suppliers," Bicher said. "You have a more efficient way of communicating." ▀

Value-Added Banking

Services that Banc of America Marketplace will offer to business customers include the following:

- Electronic invoicing
- Credit-card payments
- Automated clearinghouse payments
- Information integration via the Web, Electronic Data Interchange and XML
- Security and authentication

Conglomerate Eyes \$35M Savings in Supply Pact

ABB, IBM sign \$250M agreement as part of global standardization effort

BY JAIKUMAR VIJAYAN

ZURICH-BASED conglomerate ABB Ltd. hopes to save \$35 million in information technology costs over the next three years by using its global presence and purchasing power to drive deeper efficiency gains and economies of scale.

The company last week signed a \$250 million supply

and service agreement under which it will lease about 75,000 desktop PCs, 25,000 laptop computers and 9,000 PC servers from IBM during the next three years.

ABB offices in 80 countries will be able to buy preapproved products directly from IBM via a Web-based procurement system on ABB's world-wide intranet.

The arrangement will help

ABB cut procurement costs and get better prices on products and services from IBM, said Thomas Schmidt, an ABB corporate spokesman in Zurich. It will also let ABB standardize its PC hardware and software platforms globally, Schmidt said.

"ABB is a very decentralized [group], with more than 1,000 companies in 100 countries," Schmidt said. The PC standardization project is "one of the measures we have taken to impose global processes on the group," he added.

Having a standard hardware

and software environment will also make it easier for ABB offices to communicate with one another and to deploy global e-commerce applications, Schmidt said.

"This agreement is an important first step in making us faster, more efficient and more responsive," ABB CEO Goran Lindahl said in a prepared statement.

IBM's responsibilities as the sole contractor for the project include leasing and financing, hardware delivery and installation, asset management and support services. ▀

NYSE Board Rejects Proposal for Centralized Network

Diverse trading platforms preferred over clearinghouse

BY MARIA TROMBLY

The New York Stock Exchange board of directors last week rejected a proposal to create a central clearinghouse for stock prices — and instead endorsed a multiplatform structure that they said would allow more customer choice.

A report issued by the NYSE's Special Committee on Market Structure, Governance

and Ownership — and endorsed by the board of directors on Thursday — said that a central limit-order book (CLOB) would hurt competition and that existing technology can provide more efficient access to the markets.

The committee recommended that the NYSE continue to develop its electronic trading systems toward a structure that allows traders their choice of trading platforms.

"With our board's endorsement, the report gives us an important blueprint for building Network NYSE — a market

built on customers' choice in how they access and utilize the unparalleled liquidity, transparency and depth of the New York Stock Exchange," said NYSE Chairman and CEO Richard A. Grasso in a statement issued Thursday.

Opposed to the ITS

The report also called for a replacement of the Intermarket Trading System (ITS), a 22-year-old system that links the nation's stock markets.

"The committee believes that advances in communications technology have intro-

duced more direct and efficient means of routing orders among markets than intermarket linkages," the report said, suggesting that broker/dealers use their own information and order-routing systems instead of the ITS.

The board's decision goes directly against the recommendations of the nation's largest brokerages, which argued in favor of a CLOB at a meeting earlier this month.

"In our experience, the more customer order flow meets in one central place, the more trading spreads narrow, prices

improve and liquidity increases," said Merrill Lynch & Co. CEO David Komansky in written testimony in which he argued in favor of a marketwide mechanism for displaying and accessing the best possible bid or offer.

According to Dana Stiffler, an analyst at Newton, Mass.-based Meriden Research Inc., a central clearinghouse would raise costs for discount brokers, which currently keep prices low by keeping trades in-house, while at the same time reducing the pre-eminence of the NYSE.

"A CLOB would dilute its power," she said. "As it stands, they're still the most respected equity marketplace." ▀

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BRIEFS

Vendor Giants
Join Forces

EMC Corp. in Hopkinton, Mass., Cisco Systems Inc. in San Jose and Oracle Corp. have announced they are integrating EMC's storage technology, Cisco's network technology and Oracle's database technology into suites to simplify and accelerate electronic-business infrastructure implementation. Product blueprints for the suites will be available at www.eCOstructure.com.

Dell's New Web Way

Dell Computer Corp. in Round Rock, Texas, last week announced a new Internet services market strategy and a new Web server, the PowerApp server. Pricing for the PowerApp will start at \$1,899.

Also, Dell announced plans to sell direct to Internet service providers; provide Internet consulting services through partnerships with Gen3 Partners Inc. in Boston and Andersen Consulting in Walnut Creek, Calif.; create a division called Dell Ventures to innovate technologies for the Web; and develop universal access to the Web via wireless and high-speed Internet connections.

Personalization
Consortium

Twenty-six companies unveiled the Personalization Consortium at the Spring Internet World conference in Los Angeles. The group will discuss issues surrounding the use of personalization technologies such as privacy. KPMG Consulting LLC in McLean, Va., PricewaterhouseCoopers, American Airlines and BroadVision Inc. in Redwood City, Calif., are among the founding members.

Oracle8i Appliance
Software Ships

Oracle Corp. has announced that it is shipping Oracle8i Appliance, a rapidly deployable, preconfigured and self-administrating database server software with an integrated operating system for Intel architecture. The product is available now on Hewlett-Packard Co.'s NetServer LH4 and Intel Corp.'s Sitka servers.

Wireless Tracking Sets Sail

American President Line's service lets customers track ship containers en route

BY BOB BREWIN

AMERICAN President Lines Inc. (APL), which pioneered Web-based tracking of ship containers in 1996, has extended that tracking capability to customers carrying data-capable cellular telephones.

The new wireless service

lets customers use cell phone keypads to enter a container number or bill-of-lading number into APL's wireless Web site. That pulls up information about when the shipment left its origin port, arrived at its destination port or made other stops along the way — all displayed on the phone's screen.

APL in Oakland, Calif., also

offers its QuickTrace container-tracking service to customers who use Palm VII wireless personal digital assistants from Palm Inc.

The fifth-largest ocean transportation firm kicked off a pilot of the wireless service this month, driven in part by the widespread use of Wireless Application Protocol (WAP) cell phones in Europe and Asia.

Allowing customers to check a shipment's status when they're traveling "offers new flexibility in controlling the

global supply chain," said Hans Hickler, APL's senior vice president for information strategy and customer support.

In Europe and Asia, wireless access to information has already become more popular than access from PCs, said Hickler, who's based in Singapore. "The Americas will not be far behind," he added.

Broadband, third-generation wireless services will push even more demand for untethered access to time-critical information, Hickler said. "We are expecting that more than 525 million Internet-ready wireless devices will be shipped in the next three years," he said.

The next-generation wireless systems will let APL customers do more of their business from mobile access devices rather than from the company's wired Web site, he said.

Tim Scannell, an analyst at Mobile Insights Inc. in Quincy, Mass., said he agreed. "While WAP phones are an interesting technological demonstration of all sorts of data you can get over a cell phone, it's only a beginning. Wireless technology has a long way to go, just like when PCs first came out," he said. ▀

High-Profile CIOs Leave Posts

Allmerica, Elf executives starting anew

BY CRAIG STEDMAN

Two high-profile CIOs — Bob Bruce at Allmerica Financial Corp. and Robert Rubin at Elf Atochem North America Inc. — have resigned, in part because of upcoming changes that are in the works at those companies.

Bruce, who had been CIO at Allmerica in Worcester, Mass., for three years, and Rubin, Elf Atochem's CIO for 10 years, both left their jobs at the end of last month. And each executive said it was his own decision to leave.

In Bruce's case, he said Allmerica — an insurance and financial services company with \$30.8 billion in assets — wanted him to shift to a management role in one of its insurance businesses as part of a series of planned reorganizational changes.

"But it's really technology that's in my blood," 49-year-old Bruce said. He added, though, that he's now looking to cross over to the other side of the desk and become a senior executive at a technology vendor or a professional services firm.

"I think I really could help a technology company," Bruce said. "There are very few [vendors] out there that have figured out how to do business with me as a CIO."

Also contributing to Bruce's decision was the fact that an overhaul he launched of Allmerica's 850-person information technology department has been largely completed.

"It's time to let someone else manage it going forward," he said. "I really enjoy turn-arounds, and it's not a turn-around situation anymore."

Rubin, who's 58, said his decision to leave Elf Atochem was triggered in part by a merger between the Philadelphia-based chemical maker's French parent company and its chief rival in that country.

Technology planning related to combining the two organizations was getting started, and "I felt I would be repeating

things in my career that I had already done for the same company," Rubin said.

For example, he was involved when Elf Atochem created the North American unit by merging three U.S. companies together and again in 1998 when it bought the company that makes Plexiglas products.

Rubin added that he also wanted to depart with "enough years left in the industry that I can go out and get deep into another career." Leaving Elf Atochem "is something I've been toying with for a couple

of years, and it got to the point where I couldn't think of any reason not to," he said.

Rubin has set up a consulting firm called Valley Management Consultants LLC in Huntingdon Valley, Pa. He said he also plans to join corporate boards and teach.

Elf Atochem, a \$2 billion company with about 150 people in its IT department, said Rubin has been replaced on an acting basis by Gerard Beneteau, an executive from its French headquarters.

Allmerica, which has a \$175 million IT budget, said it hasn't named a new CIO yet. ▀



ROBERT RUBIN:
CIO at Elf Atochem
for 10 years

Hitachi Data Systems Splits

BY JAIKUMAR VIJAYAN

The massive reorganization at Hitachi Data Systems (HDS) last week fortifies the company's recently formulated strategy to reduce its dependence on mainframes alone for revenue and profits.

HDS said it will split itself into two companies, each with its own profit-and-loss responsibilities. One of them will be a platform-specific entity called HDS, which will house all of Hitachi's current hardware, software and services technologies. The other company will be called Hitachi Data Systems Solutions (HDSS) and will focus on providing business consulting, application-layer services and systems integration services.

The reorganization will allow Hitachi to better leverage its technology resources, said

Dave Roberson, chief operating officer at HDS, the new platform-specific company.

Under the new structure, HDS has been split into six independent business units, each with its own business goals and profit responsibilities.

Hitachi's latest corporate action — which will result in the loss of 600 jobs — comes on the heels of its recent decision to scale back production of its mainframe systems.

"[The reorganization] makes a lot of sense from a company perspective," said Mike Kahn, an analyst at The Clipper Group Inc. in Wellesley, Mass.

"It sort of frees Hitachi from being just a product vendor to being more of a product integrator, delivering solutions that might in fact have little to do with their traditional core products," Kahn said. ▀



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BMC Backs Project Deadline Guarantee With 20% Rebate

BY SAMI LAIS

Users of BMC Software Inc.'s Patrol systems monitoring software have a new guarantee:

Either the vendor meets project deadlines or customers get a 20% refund and the extra work is free.

The Houston-based company last week began offering an on-time guarantee for implementations of Patrol. A typical

installation involves up to 300 servers installed over three to five months.

If BMC fails to meet a dead-

line, it will now refund 20% of its service fees and provide free services until it meets the deadline.

The guarantee doesn't represent a big risk, said BMC President Max Watson. Of the more than 250 rapid deployments of Patrol that BMC has done over the past 18 months, more than 90% have been on time, he said. "It's about giving the customer confidence," he explained.

Even though it's just a matter of putting what has been BMC's standard operating procedure into a contract, the guarantee is good news, said Patrick Dryden, an analyst at Giga Information Group Inc. in Dallas.

It's also the type of commitment Jeff Loesch, manager of Unix administration at Hewitt Associates LLC in Lincolnshire, Ill., says he expects from vendors.

One of two BMC Patrol implementations at Hewitt ran past a Dec. 31, 1999, deadline, Loesch said. "BMC wound up completing the project in early March, and their services were free from January until it was finished," he said.

An on-time guarantee is appealing, and it's something Loesch said he would like to see from vendors on other projects as well. "There's almost no reason not to have it," he said. "If we deliver on our part, why shouldn't [vendors] deliver on theirs?"

"From a user perspective, I'd prefer all management implementation projects [to] be guaranteed," said Raymond Paquet, an analyst at Gartner Group Inc. in Stamford, Conn.

A contractually guaranteed deadline shortens implementations, he said.

"Studies show that projects that take longer than six months are three times less likely to achieve a good return on investment," Paquet noted. ▀

AT A GLANCE

On-Time Guarantee

Terms of BMC's Patrol installation guarantee:

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BRIEFS

SAP Units Will Form Integration Company

SAP AG said it plans to combine some systems integration business units in Germany and Switzerland with operations that are now partially owned by Siemens AG and Software AG. SAP will have majority ownership of the new company, which will be called SAP Systems Integration AG, but the three vendors expect to offer some shares to the public later this year.

Back From the Brink

Online grocery shopping and delivery service Peapod Inc. in Skokie, Ill., has been given a financial respite. Last week, an unnamed potential investor offered Peapod a bridge loan to keep it operating while negotiating "a substantial equity investment," a Peapod spokesman said.

SGI Fed Spun Off

Silicon Graphics Inc. (SGI) in Mountain View, Calif., last week announced that it would break off its federal government business as a subsidiary named Silicon Graphics Federal Inc., in Silver Spring, Md. SGI federal business manager Anthony Robbins was named president of the unit. SGI Federal will focus on modeling and simulation, geospatial imaging and visualization in e-commerce applications.

Encryption Is Speech

A U.S. Appeals Court ruled last week that Peter D. Junger, a professor at Case Western Reserve University in Cleveland, is protected by the First Amendment in posting encryption source code, overturning a lower-court decision.

Short Takes

Cambridge, Mass.-based **LOTUS DEVELOPMENT CORP.** this week plans to announce the beta availability of Domino.Doc 3.0. . . . Boulder, Colo.-based **EXABYTE CORP.** warned investors of a larger than expected first-quarter loss. . . . **EMC CORP.** in Hopkinton, Mass., appointed Joel Schwartz as president of its Data General division, succeeding Robert Dutkowsky.

Stock Market Blitz Shakes Systems

London, Toronto exchanges shut down, Nasdaq slows during record trading

BY MARIA TROMBLY

THREE OF the world's largest stock exchanges suffered from unrelated computer problems last week during heavy trading.

The London Stock Exchange was hardest hit, with an eight-hour outage last Wednesday. The exchange opened at 3:45 p.m. London time, rather than the usual 8 a.m., but hours were extended from 4:30 to 6:30 p.m. The exchange didn't say how much revenue was

lost as a result of the outage.

The problem occurred with the network that takes real-time price and other information from the central trading systems to market users, according to Gavin Casey, CEO of the London Stock Exchange, in a statement.

That same day, a system glitch at the Toronto Stock Exchange prevented the usual extra half-hour of trading from 4 to 4:30 p.m. That's when traders buy and sell stocks at closing prices and tie up loose ends.

The exchange shut down at 3:58 p.m., and although the problem was fixed immediately, officials decided to cancel the extra half-hour because traders hadn't been able to complete their orders within the last minute of trading.

"It was a software issue," said Steve Kee, a spokesman at the exchange. As of Thursday afternoon, however, the exact cause of the problem hadn't been determined.

The Nasdaq Stock Market was able to keep functioning all week but it experienced an hour-long slowdown due to a high volume of trading on Tuesday, the day after the verdict was released in the Microsoft Corp. antitrust case.

AT A GLANCE

Slow Trading

Computer problems at stock exchanges last week:

Tuesday: Nasdaq: slowdown for one hour after 2 p.m.

Wednesday: Toronto: closed two minutes early, canceled 1/2 hour of clean-up trading

London: opened at 3:45 p.m., nearly eight hours late

Nasdaq trading volume on April 4 was almost 2.9 billion shares, compared with the previous record of 2.2 billion shares on March 1.

It was the record volume that caused the slowdown, as the exchange had to shift from one computerized order file to another and reboot the system.

The problem was resolved, and the exchange will be able to make the transition smoothly if a similar situation comes up again, according to Nasdaq spokeswoman Judy Inosanto. ▀

Outages, Capacity Woes Worry Online Brokerages

Scalability should be priority, IT says

BY MICHAEL MEEHAN

System outages and capacity problems rank as the chief concerns among executives at online brokerage firms, according to a new survey by Deloitte & Touche LLP.

The New York-based accounting and consulting firm polled 60 online trading executives between November and January. It found that 60% of executives at full-service brokerages and 38% of managers at discount firms listed "system outages and mistakes/handling growing transaction volume" among their fears.

Scalability

Only 41% listed scalability as a priority. Ted DeZabala, director of electronic-business technology and security practices at Deloitte & Touche, said scalability is the root cause of the reliability and performance concerns of those executives.



FIDELITY'S STEPHEN SCULLEN: Some 85% of the brokerage's trades are now conducted online

"The fundamental issue, as we see it, particularly with the start-up and midtier companies that are building applications, is that they're designing them with a capability they exceeded many months ago," DeZabala said.

Peter Stern, chief technology officer at Datek Online Brokerage Services LLC in Iselin, N.J., took an even stronger stance.

"I was really boggled to hear that they weren't as concerned about scalability as reliability,"

he said. "Scalability lies at the heart of reliability and performance."

DeZabala called for "more robust architecture" and built-in comprehensive systems monitoring, which will troubleshoot problems and prevent crashes and delays.

Ed Powers, senior manager of Deloitte & Touche's enterprise technologies division, cited speed to market as one reason for the rickety systems.

"They take prototypes and put them up," he said. "They don't bother to test them."

Online brokerages are "taking a lot more risks in performance and reliability, and consequently, they're bigger issues than they ever were before," DeZabala said.

Fidelity Brokerage Services Inc. has witnessed the online boom firsthand.

In January 1997, only 7% of the Boston-based investment company's commission-based trades were conducted online, said Stephen Scullen, an executive vice president. That figure has since jumped to 85%.

Fidelity built a scalable system to make sure it could accommodate that growth.

Scullen explained that the online operation maintains a "4-to-1 headroom," which en-

sures that the site always has four times the capacity of the previous average peak.

Datek experienced record highs in trading for the week, which the company tackled with a strength-in-numbers system. The brokerage decided early on to create an infinitely expandable system.

"We've currently got 280 separate boxes running individual processes," Stern said. "And it's set up to handle double our peak capacity. If any one of those 280 boxes breaks down, you'll never know it."

With last week's new peak, Datek will add more computers to handle the load.

To prevent online trading bottlenecks back at Fidelity, the firm routes traffic among six national hubs. Scullen said an online service that can meet demand costs money but is worth the investment.

"If you find out your system can't handle the job, it's not something you can buy your way out of on the spot," Scullen said. "You have to plan ahead." ▀

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Continued from page 1

Users

operating systems with integrated browsers will be a moot point. Score this one for Bill in the long run," said Michael Crowley, CIO at Campbell Soup Co. in Camden, N.J.

What many end users don't want, according to a *Computerworld* poll conducted last week, is a breakup of Microsoft.

Of 132 information technology professionals polled by *Computerworld*, 70% agreed with Jackson's verdict that Microsoft used anticompetitive and predatory practices to keep its monopoly in desktop operating systems. That's a stark change from a similar survey in November, in which only 39% of IT users surveyed agreed with the judge's findings of fact.

But less than 20% said Microsoft's actions warranted breakup, and just about half favored some government regulatory action as a remedy.

Corporate users such as Paul Maier, technical services manager at AGA Gas Inc. in Cleveland, worry that a breakup will only make their jobs harder.

"It's going to lead long term to more interoperability problems," he said.

"If they are really interested in the consumer, the judge will force Microsoft to release base-level code into the open market," said Bryan Johnson, a systems analyst at ANR Pipeline Co. in Detroit. "Any developer who wants access to that code could have it, but Microsoft would get final say [about] what gets added into Windows." Such a remedy would put all developers on equal footing, he said.

A Lighter Side

But Danny Reynolds, information systems manager at Milliken Millwork Inc. in Sterling Heights, Mich., said a breakup could have a positive impact. "If they split up the [operating system] from the applications, then maybe the remaining applications business would have to develop for Linux or other platforms," he said.

Yet Reynolds said users have "to wonder about the relevance of this verdict now with the explosion of the Internet and the many ways to access information with so many providers and variables."

Jackson will receive a remedy proposal at the end of this month from the U.S. Department of Justice and the 19 states that brought the lawsuit two years ago.

He may seek an injunction against Microsoft during the remedy phase that is aimed at preventing any future predatory business practices and forcing the company to make some immediate changes.

Breaking Up Is Hard to Do

But legal experts say Jackson couldn't order an immediate breakup.

Microsoft can petition the court to stay or delay the judge's injunction, but success "is certainly not a foregone

conclusion," said Tyler Baker, an attorney in the antitrust division of the Justice Department in the early 1980s and now a partner at Carrington, Coleman, Sloman & Blumenthal LLP in Dallas.

The judge could also attempt to send the case directly to

the Supreme Court to circumvent a lengthy appeals process.

Baker said he doubts that would happen, however. "The Supreme Court is not set up to have a case of that complexity dumped on them," he said.

The verdict did give Microsoft's arguments some credit. Jackson gave Microsoft "a tidbit" when he said that, by themselves, the vendor's exclusive contracts didn't violate antitrust laws, said Yee Wah Chin, an antitrust lawyer at Squadron, Ellenoff, Plesent & Sheinfeld LLP in New York.

Most of Microsoft's legal problems in this trial stem from its decision to integrate Internet Explorer into the operating system, while pressuring companies to use its browser and not promote Netscape.

Those actions don't warrant

a breakup, according to some observers. "Those sound like conduct issues to me," said Michael Cusumano, an MIT management professor who studied browser wars in the book *Competing on Internet Time: Lessons from Netscape and its Battle with Microsoft*.

Cusumano said Microsoft officials asked him for advice on a settlement, and he recommended that they accept a conduct remedy. Such a remedy would keep the company's Windows monopoly intact, he said. "They felt very strongly about retaining their right to put whatever they want into Windows. They think they are in a good [legal] position," Cusumano said.

Microsoft has insisted throughout the trial that it wouldn't agree to anything that forces it to give up its "freedom to innovate" — its ability to determine what is included in the operating system.

But the effectiveness of any conduct remedy is unknown.

For instance, if the court required Microsoft to produce two separate versions of Windows — one with full features and another stripped-down version — PC makers aren't going to use the latter, said Mike Gotta, a senior research analyst at Meta Group Inc. in Stamford, Conn. "I don't think people will go to market with a watered-down version of Windows," he said.

Court-ordered remedies, unlike a breakup, would also involve ongoing government oversight of some kind.

"It's hard enough to coordinate an IT infrastructure, and that's all we need — lawyers and judges to coordinate it," said Jerry Lynch, director of operations at the On-

line Computer Library Center in Dublin, Ohio, which has 1,200 desktops running Windows NT. Lynch allows users to choose between Netscape Navigator and Internet Explorer.

A breakup appeals to Bob Sanowski, IT manager at United-Health Group Co. in Phoenix. "I think a breakup would be great," he said. "It would spawn a whole bunch of other companies," as the AT&T breakup did.

"Breaking up the company

would hurt me and my business the most of any remedies," said Paul Kirk, senior vice president of MIS at United Companies Financial Corp. in Baton Rouge, La. "We like a single point of contact from a vendor, and it's easier to contact one company for site licenses for all desktop needs. Breaking up Microsoft would mean I would go negotiating with new corporations for the parts split off, and I wouldn't know the viability of those companies."

But nothing will be certain

until appeals run their course.

"I'm pretty confident that they will win the appeal — at least I'm hopeful," said Tom Jeffrey, vice president of information systems at K-B Toys in Pittsfield, Mass. "I don't trust Bill Gates very far, but I trust the government even less, so if it's a matter of siding with the government or Gates, I'll pick Bill." ■

Also contributing to this article were staff members Kathleen Ohlson, Kathleen Melymuka, Julia King and Maryfran Johnson.

Possible Remedies

What they may mean for users:

1 Operating system configuration

The government may seek to stop Microsoft from automatically bundling features into its operating system. The government may allow PC makers to decide which features to add to an operating system, allowing manufacturers or end users to determine operating system configuration. The intent is to protect nascent technologies such as voice recognition.

■ USER IMPACT

Users may get the ability to pick and choose what's in an operating system, but they may have more technical support and licensing issues to deal with.

■ TECHNOLOGY IMPACT

Netscape suffered when end users had no choice but to take Internet Explorer. Third-party developers may have a better chance of competing.

2 Interfaces and source codes

Microsoft may be required to give third-party developers access to operating system application programming interfaces as soon as they're available, giving developers the ability to quickly release applications for any new operating system. More radically, the court could require Microsoft to open its source code, giving third-party developers and end users the ability to change it.

■ USER IMPACT

If the source code is opened, third-party developers could change it to improve operating system and application performance, but operating system changes made by developers could trigger system conflicts.

■ TECHNOLOGY IMPACT

Ideally, third-party applications performance on Windows should improve. Open source code could lead to Windows operating system clones, capable of running Windows applications. This could bring competitive pricing.

3 Breakup

The court could split Microsoft into separate companies, forcing them to compete against one another. It could divide the operating system division into two or three firms to compete on price and features and create separate companies out Microsoft's applications, tools and servers divisions.

■ USER IMPACT

A breakup would foster competition by ending a desktop operating system monopoly, lowering prices and giving users more choices. Opponents say costs could rise for users, as developers are forced to write applications for a variety of operating systems. A breakup may also create licensing and support problems for users.

■ TECHNOLOGY IMPACT

Competition improves innovation.



K-B TOYS' JEFFREY: "If it's a matter of siding with the government or Gates, I'll pick Bill"



MICROSOFT'S legal problems "sound like conduct issues," says MIT professor Michael Cusumano

Users Stick With Microsoft Despite Monopoly Label

Monopolies have power to force buyers to overlook high-pressure tactics, experts say

BY KIM S. NASH,
PATRICK THIBODEAU
AND DOMINIQUE DECKMYN

EVEN USERS who are appalled at Microsoft Corp.'s hyper-aggressive business behavior or who think the vendor has caused harm aren't likely to choose the high road over financial realities.

Trust, integrity and other hard-to-measure traits do factor into business choices. Yet users are torn between caring about such characteristics in Microsoft and trying to make smart business decisions.

Although 45% of 132 information technology professionals surveyed by *Computerworld* last week said Microsoft's practices have hurt users by stifling competition and in-

novation, not many seem inclined to act on it.

Charles Stevens, vice president of the Enterprise and Partner Group at Microsoft, said last week that the case isn't the most pressing topic that CIOs bring up in meetings with the vendor. "It's about the 20th question that comes up," he said. Customers whom he talks to like Microsoft and continue to want to do business with the company, Stevens added. "We've always had the highest standard of ethics," he said. "We make many mistakes. The only thing you can do is be very honest and work doubly hard to do better."

Some CIOs would like to consider a vendor's ethics when deciding whether to do a deal, but they don't have that luxury when it comes to Mi-

crosoft, said Deb Mukherjee, chief technology officer at Farmers Insurance Group of Companies in Los Angeles.

Even if a user wanted to move off Windows, Mukherjee said, "changing infrastructure is so expensive that, at the end of the day, [financial concerns] win."

Yet IT managers must share some of the blame for Microsoft's competitive excesses, said Clifford Dubord, IT manager at a nuclear power plant owned by Niagara Mohawk Power Corp. in Oswego, N.Y.

"I think in many cases, the IT industry fostered what Microsoft did, enabled it," by not protesting forcefully against Microsoft's high-pressure tactics, Dubord said.

Indeed, that often happens under monopoly rule, said David Aaker, co-author of *Brand Leadership* (Free Press, 2000) and a former professor at the University of California at Berkeley.

The dominant company has "such great market power, so people sort of accept it. They got used to it," Aaker said.

A monopolist doesn't necessarily abuse its power, but knowing it doesn't have much competition often fosters bad behavior, said Thomas Donaldson, a corporate-ethics professor at The Wharton School at the University of Pennsylvania in Philadelphia.

"The market usually self-corrects unethical behavior," he said. That is, people stop buying from companies whose tactics they don't like.

"But with strong monopolies, it's difficult," Donaldson added. "The product the customer wants is locked up [by one vendor]."

And customers know it. Microsoft has "pretty much done whatever they have chosen to do, with little input from the ultimate consumer as to whether we agree with it, disagree with it, like it or don't like it," said Cam Franklin, an infrastructure manager at Alcoa Building Products Inc. in Sidney, Ohio.

Moreover, customer loyalty involves making two commit-

ments to a company: financial and psychological, said Patricia Obermaier, president of The Alleris Group Inc., a consultancy in Herndon, Va. "It's the psychological part that might give Microsoft trouble right now," she said.

Meanwhile, the rhetoric has turned personal in Microsoft's public relations campaign to discourage a drastic remedy. As much as they say the antitrust suit doesn't distract them, the company's two top executives are very much personally involved in the campaign.

On Defense

After the ruling, Steve Ballmer, Microsoft's president and CEO, said he found "disturbing" what he called "veiled references to our values" in Jackson's ruling.

"We are a company with incredible integrity," Ballmer said. "I know how we run the business, and the intellectual honesty and personal honesty we demand from our people internally and in dealing with third parties."

Microsoft Chairman Bill Gates then flew to Washington last week to tell his side of the story to select members of Congress in closed-door sessions.

Although some pundits have said Microsoft has tempered its behavior during the 2-year-old antitrust case, most respondents in the *Computerworld* poll disagreed.

Just 15% said they had experienced a difference in Microsoft's behavior since the case was filed in May 1998, citing improved customer service and a better attitude in general.

However, it would be hypocritical and an implied admission of wrongdoing if Microsoft changed dramatically now, said Yee Wah Chin, an antitrust lawyer at Squadron, Ellenoff, Plesent & Sheinfeld LLP in New York.

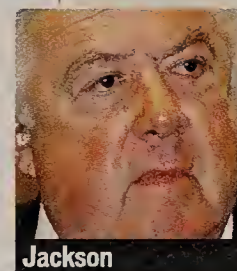
"It would be like Hillary baking cookies," Chin said. ▀

Staff writer Kathleen Ohlson contributed to this story.

Jackson's Problems With Microsoft

Microsoft trial judge Thomas Penfield Jackson ruled that Microsoft maintained its monopoly in desktop operating systems through anticompetitive and predatory tactics in violation of antitrust law.

Browser threat: When Netscape refused to abandon efforts to turn Navigator into an ap-



Jackson

plications development platform, Microsoft bound Internet Explorer with "contractual and, later, technological shackles" to PCs. Its

actions caused user confusion and system degradation leading to higher support costs. Microsoft paid "vast sums of money, and renounced many millions more in lost revenue every year, in order to induce firms to take actions that would help enhance Internet Explorer's share of browser usage at Navigator's expense."

Java threat: As with the browser, Java posed a middleware threat to Microsoft's monopoly. Microsoft "undermined" Java's portability with its own implementation, and "induced" developers to use its implementation of Java through "subterfuge and barter" and by minimizing Navigator's market share.

Exclusive dealings:

Microsoft used contracts to curtail Netscape. Compaq Computer Corp., the judge wrote, essentially ceased to distribute or pre-install Navigator at all in exchange for significant financial remuneration from Microsoft. But while the exclusive agreement pre-empted the most efficient distribution channels, Microsoft's agreement "did not ultimately deprive Netscape" of the ability to distribute its browser via the Internet.

Consumer harm:

"Microsoft's anticompetitive actions trampled the competitive process through which the computer software industry generally stimulates innovation and conduces to the optimum benefit of consumers."

— Patrick Thibodeau

Winners and Losers

Last week's federal pronouncement that Microsoft is an abusive monopolist was good for some, bad for others

WINNERS

Old Economy. Whether or not your com is dotted, 110-year-old antitrust laws still apply.

Risk-taking investors. They can buy Microsoft stock at a new low price.

IT managers. While Microsoft remains on the defensive, you have extra leverage in purchasing talks.

Ambulance-chasing lawyers. At last count, consumer class-action suits against Microsoft numbered more than 100.

Microsoft. Company is still free to treat rivals and partners the way it likes during lengthy appeals process.

LOSERS

New Economy. The tech-laden Nasdaq tumbled along with Microsoft stock (see stories, pages 12 and 107).

IBM and other out-of-favor PC makers. They were looking for a fast settlement that forced Microsoft to equalize Windows pricing.

Al Gore. George W. Bush has already said he sides with Microsoft. Would a Gore administration have the will to break up one of the most successful companies ever?

Microsoft. It's official: Bill Gates runs an abusive monopoly.

Netscape 6 Beta Released; Users: Too Little, Too Late

Some say browser wars over, and IE wins

BY DEWAYNE LEHMAN

NETSCAPE Communications Corp. last week made available a preview version of its long-awaited browser upgrade. But users said Netscape 6 may be too little too late.

Netscape 6 will be powered by the open-source Gecko browser engine. It will offer faster performance on desktop PCs and can be adapted to several other Internet devices and computing platforms, including Linux, Mac OS and Windows, company officials said.

"The reason it's taken time to develop Netscape 6 is be-

cause we've built a better browser," said Eric Krock, a senior product manager at the Mountain View, Calif.-based company.

In 1998, Netscape scrapped plans to develop an incremental version of its browser and instead rewrote the entire program to implement open Web standards, including HTML 4.0, XML and JavaScript 1.5, he said.

Netscape 6 will also include features that allow users to customize the look and feel of their browsers and add tabs for constant, easy access to Internet content providers.

Despite the advancements, users don't see the new brows-

er making waves. "I really think the browser wars are over," said Bob Offutt, a vice president at Sabre Labs, the information technology arm of Sabre Inc. in Fort Worth, Texas.

Even if Netscape's browser brings improved support for standards, "you have to design to the lowest common denominator" in Microsoft's and Netscape's browsers," since end users don't always upgrade immediately to the new version, Offutt said.

Although the browser "may come off as no big deal today," it could have long-term significance, according to Scott Hebner, director of electronic-business technology at IBM. If developers move more toward integrating browsers into their

applications, Netscape could be reinvigorated, he said.

Pamela Drew, lead technical designer at First Union National Bank in Richmond, Va., said she would most like to see Netscape's and Microsoft's browsers become more compatible with each other in terms of standards and features support. Then her company's Web developers would no longer have to write two sets of code.

"We had to go through the whole browser detection scheme: If they're running Netscape, use this; if they're running Internet Explorer, use this," Drew said. "For the public sites, we end up having to go back and debug things for different browser versions." She said the situation has been

improving, "but it's still not there yet, and it just makes it difficult for those of us who have to write for them."

Netscape, owned by America Online Inc., will release two more betas of the browser before it releases a final version by the end of this year, Krock said. Microsoft's Internet Explorer 5.5 also is in beta now.

Dulles, Va.-based AOL last week also unveiled a series of Internet appliances designed in cooperation with Gateway Inc. in North Sioux City, S.D., that will adapt the Gecko browser. The appliances will allow users to access "Instant AOL" — a slimmed-down version of the AOL software — and the Internet throughout their homes via wireless devices that feed off a central hub, much like a cordless phone does.

The first of the devices, a countertop or under-the-cabinet flat-screen system, will be available by year's end, according to the company. ■

Staff writer Carol Sliwa contributed to this story.

Continued from page 1

Linux Fortunes

to sell non-Microsoft solutions to upper management," said Rocco Esposito, information technology director at window-shade maker Hunter Douglas Inc. in Broomfield, Colo. Esposito currently uses Solaris and NetWare as well as Windows NT but has no plans for Linux.

Leading figures of the Linux world believe the rapid rise of Linux during the past two years has been aided by the Microsoft trial. "Without the trial, you would not have had the OEMs so openly embrace other platforms," said Ransom Love, president and CEO of Linux vendor Caldera Systems Inc. in Orem, Utah.

"Keeping Microsoft decent is allowing companies to offer our products to customers," agreed Bob Young, chairman and co-founder of Red Hat Inc., another Linux vendor, in Durham, N.C.

Despite the trial, "we have been adversely affected by fear, either perceived or real, of Microsoft retaliation," said Love. He said he believes last week's verdict will encourage more PC

vendors to ship Linux systems.

Mike Prince, vice president and CIO of Burlington Coat Factory Warehouse Corp. in Burlington, N.J., is implementing thin clients based on Linux on the desktop. He said concerns

about Microsoft's business practices and the proprietary nature of its software played a part in that decision. "We come from a mainframe environment, [and] developing a dependence on Microsoft technologies felt like going back to the mainframe era," said Prince.

That is a minority view, as Prince is quick to acknowledge. An overwhelming majority of users — 95% in the Computerworld survey — said the Microsoft verdict won't influence their reliance on Microsoft technologies.

Terry Stelzer, IT manager at Meritor Automotive in Troy, Mich., said that in a 10,000-desktop company, changes are hard to make. "We've heavily committed [to Microsoft products] with training and time and user skill sets, and Microsoft knows all this," said Stelzer.

Several Linux proponents said they believe court-imposed remedies could further help Linux. Young said the court should open Microsoft's source code to developers, which will improve interoperability between Windows and Linux. And Prince said a company breakup may result in a version of Office for Linux.

"At the very least, we are

now operating on a more level playing field," said Young.

Other analysts agreed that Microsoft's loss could be Linux's gain.

Michael Gartenberg, an analyst at Stamford, Conn.-based Gartner Group Inc., said his research firm is advising customers to reduce their "lock-in" on Microsoft products wherever possible.

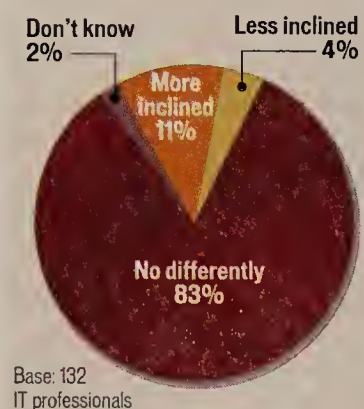
"They will lose market share, and they are expecting

to lose market share," said Eric Klein, an analyst at The Yankee Group in Boston. He said NetWare, Linux, Macintosh and even the Be operating system "now have opportunities because of the changing dynamics of the market."

Microsoft also "has some catching up to do in appliances," where Linux has an edge, according to Joe Clabby, an analyst at Boston-based Aberdeen Group Inc. ■

A Few Plan Change

As a result of the verdict, are you more inclined, less inclined or no differently inclined to consider other desktop operating systems?



Of those inclined to change, which other desktop operating systems will you consider?

Linux: 73%
Other: 35%

Base: 132 IT professionals
*Multiple responses allowed.

Candidates Avoid Taking Stances

Though the Microsoft trial has been international front-page news, neither of the top two contenders for the U.S. presidency was taking a stance on the subject last week.

Texas Gov. George W. Bush released a statement Monday saying, "Because the Microsoft case remains in litigation, no remedies have been decided and is likely to be appealed, I do not think it's appropriate to discuss the specifics of a matter that is pending before the court. As president, I will fully enforce antitrust laws to foster competition and innovation, to pro-

tect customers and to guard against anticompetitive conduct." His campaign offered no more details as the week progressed.



George W. Bush

The campaign for Democrat hopeful Vice President Al Gore offered even less comment, leaving unanswered the questions of what remedies he believes are appropriate and whether the U.S.

Department of Justice needs to put more or less focus on high-tech antitrust cases.

"He's not going to comment on that," said Gore spokeswoman Melissa Ratcliff. — Michael Meehan

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Millions of Obsolete PCs Enter Waste Stream

IT departments struggle to figure out what to do with old computers

BY KIM S. NASH

PEOPLE SWAMP Web sites that offer free computers, but Paul Kirk couldn't give away 800 Pentium PCs last fall.

Computer disposal firms declined to take the machines, saying they were already loaded with castoffs that weren't year 2000-compliant. Charities and schools said 133 MHz was too slow for them.

Finally, Kirk, information technology manager at United Companies Financial Corp. in Baton Rouge, La., was able to sell about 400 PCs to employees for \$5 each. The rest went to recyclers that dismantled them and sold the scrap copper, gold and glass.

There's an overlooked byproduct of Moore's Law: more garbage.

Companies that upgrade hardware every three years face an increasingly critical problem: what to do with tired, old computers.

Only 39% of 102 IT managers surveyed by *Computerworld* said they have a consistent, companywide policy for dealing with retired hardware.

"People continue to ignore the situation. It's bad all around," said Frances O'Brien, an analyst at Gartner Group Inc. in Stamford, Conn.

Think about the volume: More than 20 million PCs be-

came obsolete in 1998 — but just 14% of those were recycled or donated, according to the latest figures from the National Safety Council, an environmental watchdog group in Washington.

Gartner says 114 million PCs were sold last year, and another 133 million will be sold this year. And they'll all need a final resting place in a few years.

Costly Storage

Without a plan in place, PC disposal is a scramble for IT departments. Many companies actually end up spending money on machines that are no longer worth anything, either by paying recyclers to haul them away or by warehousing them for lack of a better idea.

For example, while Kirk was trying to shed his retired PCs, the machines sat for six months in building space that United Companies normally rents out for \$17.50 per sq. ft.

"The rate of obsolescence in computer and electronics industries is so incredible that you have vast quantities of waste entering the waste stream, and the infrastructure to deal with that hasn't developed," said John Hanson, executive director of the Recycling Council of Ontario in Toronto.

Meanwhile, some recyclers — which buy used gear to resell or dismantle for scrap — are so flush that they're turn-

ing away business.

Roughly 17% of users in the *Computerworld* survey admitted to throwing PCs out with the trash (see chart). Yet when computers sit in landfills, environmentalists say, poisonous chemicals such as lead and cadmium escape into the air, soil and water.

Hardware disposal is now "a lot more pressing for us," said Joe Burrus, desktop coordinator at Apache Corp., an oil company in Houston. "It would be nice to get three years out of a good desktop, but it's just not working out that way."

Burrus and his staff recently spent several weeks erasing hard drives and finding nonprofits to take 250 Compaq Computer Corp. Pentiums that were no longer usable by Apache after its Y2k remediation.

An upgrade to Microsoft Corp.'s Windows 2000 late this year will produce another 150 used Compaqs to deal with, he said. Burrus plans to donate them but doesn't know exactly where they will go.

The task of finding proper homes for retired equipment often falls to environmentally conscious IT staffers.

Ruesch International Inc. Chief Technology Officer Ron Szoc and his staff recently ushered 150 used PCs to local shelters and children's homes.

Still, Ruesch, a finance firm in Washington, ends up junking some machines. "No one wants a 286. You can't run [the latest] Windows on it," Szoc said. "It's like an empty tin can. You need to throw it away." He figured the company has tossed 10 or 15 such boxes.

Part of the problem is no one group wants to take responsibility for hardware disposal.

Many user companies and analysts say PC companies should take back retired hardware. Indeed, some do — but only for their very biggest cus-

tomers and only if a deal is made at the time of purchase or lease.

Garbage collection companies say PC makers should use safer, nontoxic materials during manufacturing.

PC companies generally say that local governments should

The U.S. Environmental Protection Agency classifies computers as hazardous but hasn't aggressively enforced disposal regulations.

Europe, however, is taking a tougher stand. The U.S. exports \$40.6 billion in high-tech gear to Europe annually, and the European Commission thinks the industry could act more responsibly.

The EC wants to force PC makers to take back used equipment, at least in Europe. The so-called directive on Waste from Electronics and Electrical Equipment (WEEE)

would also require PC companies to phase out harmful materials in manufacturing by 2004.

Some hardware companies are already moving in that direction but only in certain plants and only for some toxins.

A vote on WEEE is expected this month, and PC companies are vigorously fighting it.

Through various trade groups, including

the American Electronics Association (AEA), PC firms say the cost of taking back all of their old products and revamping their manufacturing processes would be too onerous and a barrier to trade. The AEA has urged U.S. Trade Representative Charlene Barshefsky to object to the proposals, which she has done.

The AEA says PCs aren't really harmful in practical terms. "It's not like people are opening the things up and eating [what's inside]. It's the degree of exposure that's important," said Jennifer Guhl, a lobbyist at the AEA in Washington.

While the state of Massachusetts decreed April 1 that monitors must be recycled, the federal government isn't expected to enact anything similar to WEEE, experts agreed.

Lacking guidance from regulators or the waste industry, corporate IT managers are on their own. Analysts such as Gartner's O'Brien urge users to figure disposal into their total cost of ownership estimates and, more important, devise formal PC retirement policies before buying the machines.

"You've got to start taking responsibility for this," she said. ▀



CARELESS STORAGE of computers that are awaiting recycling

set up facilities for the safe disposal of computer junk.

But computers are a mix of varied, and sometimes toxic, materials. That makes recycling difficult and time-consuming, because someone has to separate the parts, said Gary Kelman, an officer at the National Association of Environmental Professionals in South Portland, Maine.

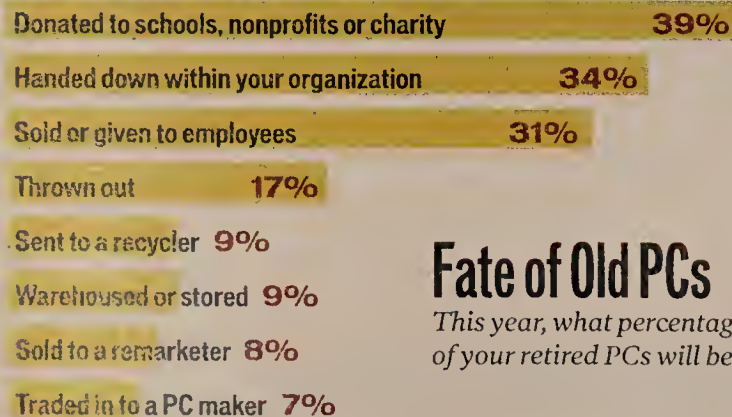
Toxic Seepage

"What you don't want to do is incinerate [whole PCs]," Kelman said, because that releases mercury, cadmium, lead and other toxic chemicals into the air.

Dumping computers into landfills isn't any better. "Lead and solder could slowly get into groundwater," he said.

That's not necessarily so, countered Jason Rose, assistant operations manager at Idaho Waste Systems Inc. in Boise.

Computers do end up in Idaho Waste landfills, but the company guards against poisonous seepage, Rose said. "There's a liner system in there and a collection system to keep anything from migrating away from the landfill into water," he said.



Fate of Old PCs

This year, what percentage of your retired PCs will be:

Base: 102 IT managers; multiple responses allowed



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KPMG Study: Shippers Want Better Service From Carriers

Carriers say online business-to-business improvements are six months away

BY LINDA ROSECRANCE

IF TRANSPORTATION companies want to stay competitive in the e-commerce arena, they had better improve their business-to-business services and think differently about the way they use technology, according to a recently released study by New York-based KPMG Consulting Inc.

And even though most carriers, such as trucking companies and railroads, thought they were satisfying shippers' e-commerce needs, shippers said that just isn't the case, according to the study, which polled 22 major transportation companies, 14 Fortune 500 shippers and eight analysts.

The survey found that shippers want carriers to offer the following Internet capabilities: better shipment tracking, online invoicing/payment information and online ordering.

Shippers also want to be able to plan their routes online in conjunction with the carriers. However, according to Kathy Capellini, a transportation analyst at KPMG, carriers are more narrowly focused on providing transactional services such as order placement and bill payment.

Carriers Expect E-Commerce

Even so, the study found that carriers believe that, within the next six months, they will make great strides toward offering the shippers their desired level of Internet e-commerce.

Dan Bingeman, assistant vice president for supply-chain logistics at Canadian National Railway Co. in Montreal, said he agrees that, at least in the rail industry, carriers and shippers aren't always on the same track when it comes to supply-chain management.

"Railroads are from Mars, and shippers are from Venus," Bingeman said at a recent freight conference in St. Louis

that focused on how to make electronic business work for the customer as well as the railroads. Bingeman said Canadian National is developing a strategy to help customers manage their supply chains more efficiently.

At the conference, Marty Coalson, assistant vice president of pricing at Union Pacific Railroad in Omaha, said his line realizes it has to better manage the demand from shippers with its ability to supply railcars.

But while railroads say they recognize the need to improve customer service, some shippers say electronic business isn't working.

Chris Fernandez, logistics manager at KoSa Chemical, a polyester producer in Houston, said he wants to know how e-commerce will work for customers once it is more widespread in the rail industry.

"If there is any benefit from e-commerce, I hope the paradigm will shift so rail makes sure [our] products arrive on time," he said.

David Broughton, a transportation analyst at A. G. Edwards & Sons Inc. in St. Louis,

said the Internet's value to a company depends on what a shipper is trying to move.

"If you're moving a low-value, high-density product like gravel or coal, who cares about [managing the supply chain]?" he said. "But if it's a high-value, low-density product like computer chips, then a lot of attention is going to be paid to [a carrier's] ability to give the shipper the capability to know where his goods are at all times and whether they're going to get where they're supposed to be on time."

Capellini said that if transportation companies don't make changes and offer ship-

Great Expectations

KPMG's survey found that both carriers and shippers want to achieve "interactive" e-commerce

47%

of shippers say carriers aren't meeting expectations for performance in using the Internet

64%

of all companies surveyed indicate that the Internet is very important in managing their future business

Base: 22 transportation companies, 14 Fortune 500 shippers, 8 transportation analysts

SOURCE: KPMG CONSULTING INC., NEW YORK

pers more interactive Internet capabilities, they may lose future business to more Web-savvy dot-com market exchanges, such as Transplace.com, that can match customer needs to carrier capacity. ▀

Web Outpaces Crypto Rules

E-commerce defeats attempts to regulate

BY ANN HARRISON
TORONTO

The growth of e-commerce and the corresponding need for privacy and security are eclipsing government attempts to curb strong encryption worldwide, according to a study released last week by the Washington-based Electronic Privacy Information Center (EPIC).

"Governments attempting to develop e-commerce are recognizing that encryption is an essential tool for transactions and are reversing decades-old restrictions based on national security concerns," according to the study "Cryptography and Liberty 2000, An International Survey of Encryption Policy."

For example, in January, the U.S. relaxed export controls on mass-market encryption software. Former regulations had required companies to obtain a government license to export encryption products with key lengths higher than 56 bits.

"We won, we've really won. There is no going back," said Phil Zimmermann, creator of

the widely used Pretty Good Privacy encryption software. Zimmermann was in Toronto last week for the annual Computers, Freedom and Privacy conference. "They are letting strong crypto through, and it would be politically difficult to single out one product."

Privacy advocates found another reason to celebrate last week: Canada passed the first privacy legislation in the world that applies to private industry. According to Stephanie Perrin, former director of privacy policy at Industry Canada, the law is based on a model privacy code created by the Canadian

Standards Association.

"Canadian companies, if they're dealing with American counterparts, oblige them through contract to meet the standards," said Perrin. The legislation applies to companies in industries that are subject to Canadian regulation.

She noted that the Canadian Direct Marketing Association supported the law, which is called the Protection of Personal Information and Electronics Documents Act.

Encryption Control Remains

But David Sobel, EPIC general counsel, said several countries, including the U.K., India, Belgium and the Netherlands, are still considering proposals that would give public agencies the ability to demand access to encryption keys. Other countries, such as China, Russia and Pakistan, continue to restrict the use of encryption technology.

According to the EPIC report, the continued expansion of e-commerce and the lack of international consensus on encryption regulations will frustrate efforts by those countries to continue their restrictive policies. The study added that the availability of encryption on the Internet will also make it difficult for countries to enforce these laws without imposing censorship and surveillance.

"Legislation... drives crypto

activists to develop new and better forms of encryption," said David Del Torto, executive director of the San Francisco-based Crypto-Rights Foundation, which provides security consulting to human rights activists. ▀

Actant Plans ISE Interface

BY MARIA TROMBLY

Swiss software vendor Actant AG plans to move into the U.S. market by June with the delivery of a user-friendly interface to the International Securities Exchange (ISE).

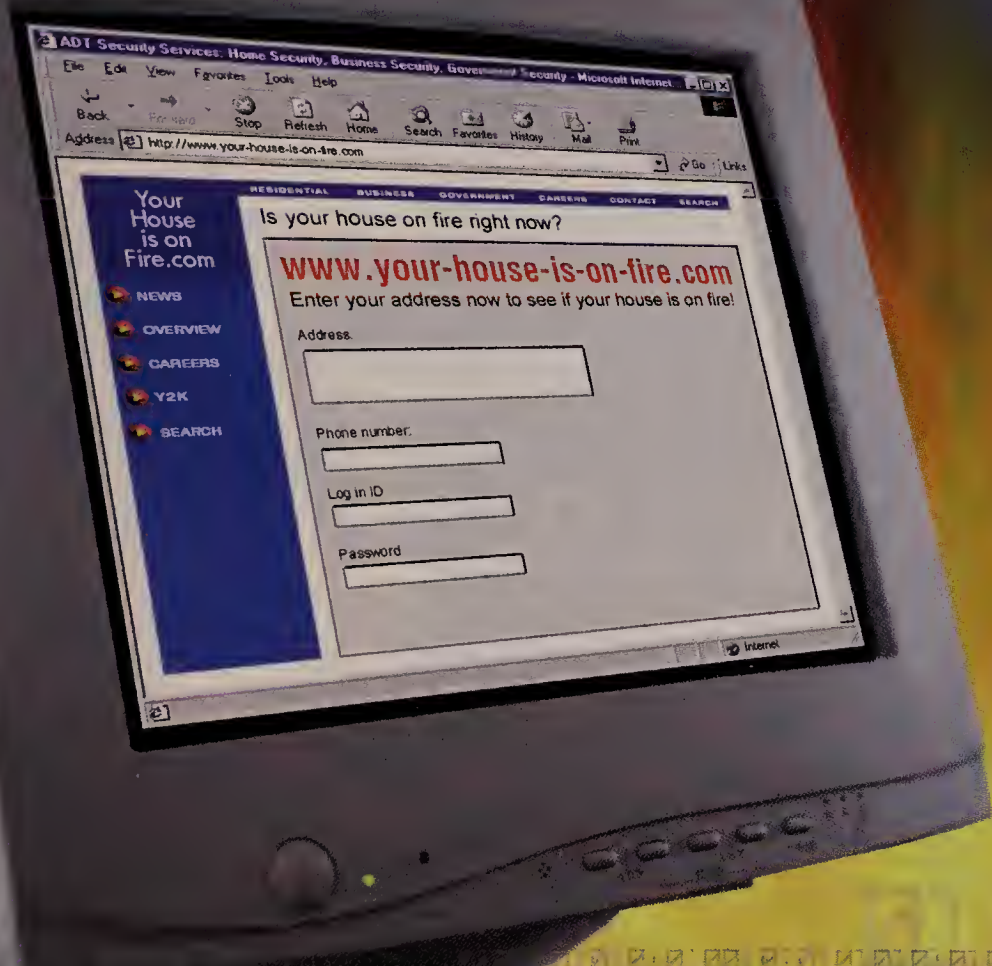
Interfaces to the Archipelago LLC and Instinet Corp. electronic communication networks (ECN) will follow by the fourth quarter, according to Actant spokesman Heiner Staub. The New York Stock Exchange, The Nasdaq Stock Market Inc. and the American Stock Exchange will be next to receive interfaces, Staub said.

Actant is a leading European provider of third-party interfaces to electronic stock exchanges, according to Staub. Its entry into the U.S. market will help speed the conversion from floor-based to electronic trading of derivatives, he said. ▀

Legislation... drives crypto activists to develop new and better forms of encryption.

DAVID DEL TORTO,
EXECUTIVE DIRECTOR,
CRYPTO-RIGHTS FOUNDATION

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reaches customers
only on the Web,
your customers
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7-Eleven to Offer Financial Services at In-Store Kiosks

BY MARIA TROMBLY

7-Eleven Inc.'s customers will soon be able to cash checks, purchase money orders and

even buy tickets and shop online via automated teller machines (ATM) in the company's ubiquitous convenience stores.

Initially, the financial kiosks will be rolled out at more than 200 7-Eleven stores in the Dallas/Fort Worth area in June

or July, the company said.

Dayton, Ohio-based NCR Corp. will provide the ATM kiosks, and New York-based

American Express Co. will provide the initial set of financial services, including check cashing, money orders and wire transfers.

Starting in the fourth quarter, 7-Eleven customers in the Dallas area will be able to buy books and CDs, download movies and get directions from the ATMs, said Margaret Chabris, a spokeswoman for Dallas-based 7-Eleven. But the ATMs won't be general-purpose Web browsers, she added.

"People can buy some very specific things over the Internet that lend themselves to being delivered to the 7-Eleven store," she said.

The service could be particularly convenient for customers who don't want to wait at home for a delivery, Chabris said. There will be fees for all of the services.

Expanded Offerings

Some 40 7-Eleven stores in Austin, Texas, already use NCR ATMs for services such as check cashing, said NCR spokesman Rob Evans.

He said the process works as follows: First, a store clerk checks a customer's driver's license. Then the ATM's camera matches the customer's face against a database of facial scans. Finally, the check is scanned and the ATM verifies the amount. As a backup, a person at a central help desk is notified when problems arise.

Evans said the facial scans are fairly accurate and can even distinguish between twins, but help desk personnel will be available in case there are multiple matches.

Eventually, he said, NCR will move toward an iris identification system, which is even more accurate. ▀

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7-Eleven will partner with American Express and NCR to offer ATMs with a variety of financial services:

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- Wire transfers

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BRIEFS

CA Settles

Computer Associates International Inc. has said it will settle litigation filed against it by shareholders over alleged excessive compensation packages awarded to top CA executives. The executives will return to the company 4.5 million shares of stock worth about \$260 million, said the Islandia, N.Y.-based software vendor. Last November, Delaware Chancery Court Vice Chancellor Myron Steele ruled that the CA executives should return 9.5 million shares valued at approximately \$550 million.

Y2k Bug Bites Unisys

Once thought to be exterminated, the year 2000 bug has managed to put the bite on first-quarter revenue at Unisys Corp. The Blue Bell, Pa.-based company announced last week that its first-quarter revenue will be a lower-than-expected \$1.66 billion to \$1.69 billion. Unisys cited lingering weakness in its federal government business and a slow recovery in its financial services business following the Y2k transition as the key contributors to its reduced revenue outlook.

Peregrine, Harbinger In \$2.1B Merger

Electronic-business software vendor Peregrine Systems Inc. and business-to-business e-commerce software provider Harbinger Corp. announced an agreement to merge in an all-stock deal valued at \$2.1 billion. By joining forces, Peregrine and Harbinger said they aim to become the industry's largest provider of electronic-business software and systems. The combined company would have about 44,000 customers and a network of electronic marketplaces that process more than 1 million transactions per day, Peregrine and Harbinger said.

AT&T, BT, Concert to Build Net Data Centers

AT&T Corp., British Telecommunications PLC and Concert, a global Internet provider network venture between the two companies, have announced plans to build 44 Internet data centers in 16 countries.

App Integration Market Experiences Stock Slump

Analysts say tumble wasn't a surprise, because sector was due for a correction

BY LEE COPELAND

APPPLICATION integration vendors last month watched helplessly as a kind of March madness hit their once-soaring stocks. On a tear for the past several months, the stocks took a beating as part of a broader correction in the technology sector that hit integration vendors hard, according to analysts.

Shares of application integration tool vendors New Era of Networks Inc. (NEON) in Englewood, Colo.; Wilton, Conn.-based Mercator Software Inc.; and Tibco Software Inc. in Palo Alto, Calif., gained dramatic momentum and then tumbled almost as quickly.

For example, Tibco's stock hit a high of \$147 March 9. By April 3, the stock's value had dropped more than 50%, closing at \$67.81.

Financial analyst J. C. Simbana at American Fronteer Financial Corp. in Denver said the technology sector was due

for a correction and application integration vendors with soaring stock prices were prime for trading.

Fabulous Gains

"At that point, institutional investors were sitting on fabulous gains and had to make the decision to lock into those gains by selling positions," Simbana said. "When you have a 10% correction within Nasdaq composite stocks, you can expect some niches will correct even further."

NEON, one of the hardest-hit vendors, had climbed to an

all-time high of \$96.25 on February 29. The stock has since retraced its tracks and was in the low \$30s late last week. Even a pledge issued to Wall Street on March 31 by NEON CEO George Adam, stating that the company would slightly beat analysts' earnings expectations for the first quarter, failed to stem the slide.

Analysts said speculation about the future of NEON's relationship with IBM contributed to the stock's slump. For the past two years, IBM has licensed a rules engine from NEON for its MQSeries Integrator tool. Version 2.0 of MQSeries Integrator, released last week, contains NEON rules and software developed in-house by IBM, but it's less

dependent on NEON than the previous version, IBM said.

NEON also licenses technology to BEA Systems Inc., Microsoft Corp., Oracle Corp., Commerce One Inc. and several other technology firms.

Industry analyst Gary Barnett at research and consulting firm Ovum Ltd. in London said the widespread use of NEON's software by other vendors aids end users by making it easier to support mixed computing environments.

Don't Worry About the Bully

"My clients do not want a huge proliferation of different products in their messaging infrastructure," Barnett said. "It's significant that NEON's technology architecture is capable of supporting different middleware players. If you have many friends in the playground that are big, it's less likely to have to be wary of the playground bully."

Simbana said he expects the application integration market to rebound, but not to the levels seen earlier this year.

"Some stocks were trading at rich multiples and may not reach that price again," Simbana said. ▀

March Madness

A look at the stock prices of application integration vendors:

	NEON	MERCATOR	TIBCO
April 3	\$31.75	\$69.88	\$67.81
March 15	\$83.48	\$112.00	\$119.25
March 1	\$89.94	\$90.63	\$130.13
Feb. 15	\$61.25	\$72.88	\$74.04
Feb. 1	\$53.88	\$64.88	\$50.50

Legato Revises Quarterly Earnings Again

Product rollout marred by problem

BY KATHLEEN OHLSON
AND MARK HALL
SAN FRANCISCO

For the second time in three months, Legato Systems Inc. is restating its quarterly earnings, damaging its image and stock price in the process. And this time, the damage is overshadowing its entry into the Linux market.

Last week, the Mountain View, Calif.-based company said it will delay filing its 10-K, which reports sales and other financial information for last year, because it discovered that "a small number" of its sales-

people entered into side agreements worth approximately \$7 million of Legato's \$71.3 million fourth-quarter sales.

Combined with its previous financial restatement in January, last week's development caused the company's stock price to collapse from more than \$80 per share in December to \$15 last week, which nears its 52-week low.

"This hurts its credibility significantly," and there are questions about how Legato recognizes its revenue, said Mark Kelleher, an analyst at Boston-based SunTrust Equitable Securities.

The departure of the company's executive vice president for worldwide sales, David Malmstedt, will help restore

credibility, Kelleher said.

The scandal provided the subtext for a product introduction here, where Legato announced its new eCluster high availability product for Linux as well as its wanCluster offer-

This hurts
[Legato's]
credibility
significantly.

MARK KELLEHER, ANALYST,
SUNTRUST EQUITABLE SECURITIES

ing for site-to-site fail-over.

Carolyn DiCenzo, chief analyst at Dataquest, a San Jose-based division of Gartner Group Inc., said it's ironic that Legato found itself in its current predicament.

"This is a very conservative company that needs to get much more aggressive in promoting its technology and, it seems, less aggressive on its sales reporting side," she said.

Legato's near-bottom stock price and solid products have also made it the target of widespread takeover rumors. Company executives, industry analysts and third-party suppliers at the event here all speculated on possible buyers. Companies rumored to be hungry for Legato include: EMC Corp. in Hopkinton, Mass.; BMC Software Inc. in Houston; and Veritas Software Corp., also in Mountain View. ▀

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What is Windows 2000 Advantage?

Windows 2000 Advantage is the partnership among Microsoft, Compaq and Computerworld Enterprise Business Solutions to inform IT leaders about Windows NT and Windows 2000 technology by providing timely, useful information — in print and online — for planning and deploying Windows NT and Windows 2000 with Compaq services and solutions.

Online This Week

Compaq, Microsoft building ProLiant Datacenter strategy

In an effort to move into the market now served by mainframe and midrange servers, Compaq is introducing ProLiant 32-processor servers for large Internet and e-commerce applications that need higher performance, reliability and scalability.

Global QTEST network opens Windows 2000 doors to users

When you combine Compaq's Windows 2000 expertise with the eagerness of its Services organizations to help customers, one result is QTEST, a dynamic global Windows 2000 environment with 150 servers.

Windows DNA 2000: Linchpin in Microsoft's e-comm strategy

Windows Distributed interNet Application (DNA) is a conceptual model and a family of products that embrace a number of products and technologies targeted primarily at e-commerce Web sites. When fully developed, Windows DNA 2000 will offer these sites scalability, load balancing, partitioning and application integration.

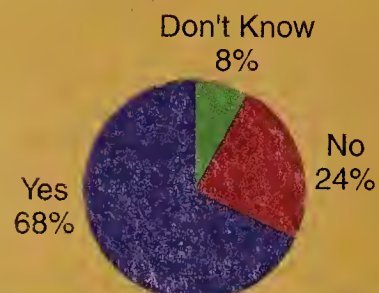


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Windows 2000

When to use different Active Directory models

By Bob Williams

Windows 2000 makes it possible to configure the enterprise in a great number of ways. Since no two enterprises are identical, successful deployment is based on an understanding of how to employ Active Directory's flexibility, scalability and granularity. This article explores the relative advances of different domain models, the use of organizational units and basic site considerations.

Active Directory has two fundamental components. First, it is a data store of all indexed network objects. Second, there is a service component that locates and manages these objects. Within Windows 2000's hierarchical and distributed environment, objects including software applications, data files, printers, users and other workstations or servers can be located anywhere in the enterprise. It makes network resources available to authorized users and groups; therefore, it also provides an important security role.

Active Directory embraces a great number of industry standards in order to enhance interoperability. For example, the domain name service (DNS) is used to identify enterprise domain controller services. The Lightweight Data Access Protocol (LDAP) resolves the location of objects. The use of such standards permits exchange of data and administration across other platforms, including Unix and NetWare. While the interoperability is far from complete, it is a major step forward.

Active Directory structural components

Active Directory is divided into logical and physical structures. These structures, respectively, involve the organization and communication of network objects. (There is also a third component called the schema that provides and manages definitions of known objects.)



The logical structure

Base logical components of Active Directory are objects and their associated attributes. They are organized by Active Directory around a hierarchical domain model. The domain model logically arranges objects around administrative, security and organizational boundaries.

Unlike Windows NT, Windows 2000's Active Directory utilizes multi-master replication to communicate information and replicate changes. The building blocks are defined by relationships known as domains, domain trees, forests and organizational units. Active Directory scales across environments ranging from a single server to a domain of 1 million users or more. ▀

For the full text of this story, visit www.Windows2000Advantage.com.

ADVANTAGE

The Web Magazine for IT Leaders
Implementing Windows NT and Windows
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► Q&A

Users say Win 2000 benefits are worth deployment journey

By Bob Williams

During the course of the previous year, my company, Enterprise Certified Corp., has worked with many system administrators, software engineers and system architects responsible for review and deployment of Windows 2000.

Recently, I interviewed three very knowledgeable and respected IT professionals to obtain their view of Windows 2000. Bryon Beilman of Collective Technologies is a senior consultant who specializes in operating system administration. Rick Kingslan (MCSE+I, MCP+I) is an independent systems consultant who specializes in Windows 2000 infrastructure design. James Morris (MCSE and MCP+I) is a systems engineer at the University of Washington.

Q. You have been working with Windows 2000 during the product beta. Now that the product is generally available, does the release meet your expectations or does it fall short?

Beilman: Overall, it meets my expectations. They have integrated a significant amount of new technology into Windows 2000. I am particularly happy that they have enhanced the directory services and security services.

Kingslan: The release of Windows 2000 is huge for the business environment and greatly exceeds my expectations. There was some rocky going early on in the beta cycle, but Microsoft seemed to quickly straighten out the problems, got the project back on track and delivered a good product.

Morris: By and large, the release more than meets my expectations. The overall stability and hardware support is incredible, especially when compared to NT 4 and Windows 98 in its various flavors. Windows 2000 begins the end of the WINS nightmare as well as practically ending DLL Hell.

Laptop support is vastly improved as is the out-of-the-box security. The user interface incorporates all our favorite features from Windows 98 as well as a large number of new features. Lastly, some of the greatest improvements have been made in management and administration, including the delegation, the number of available tools and the granularity of permissions and privileges. Overall, it's definitely a "must-have" OS in the corporate environment. ▀

For the full text of this roundtable, visit www.Windows2000Advantage.com.



Point of View

Enterprise Vantage: Win 2000 deployment tips

By Bob Williams

Now that Windows 2000 is a commercial reality, the time has come to explore planning and deployment issues. If you have an enterprise of any appreciable size, *please* do not assume that this is just another software upgrade.

Windows 2000 introduces a great number of enhancements and innovations. However, the wealth of functionality available in Windows 2000 also has a counterpoint — in order to effectively utilize these features, you must understand and plan for their deployment.

With Windows NT and other operating systems, it was possible to segment deployment in a piecemeal fashion. Windows 2000 provides much more global approaches that require a comprehensive view of the enterprise.

I want to provide some commonsense beginning points for the deployment of Windows 2000. Since there is no such thing as a one-size-fits-all computing environment, we must draw more generalized pictures.

Having worked extensively with Windows 2000 beta versions for over a year, my col-

leagues and I have gained valuable first-hand experience, some of which stems from costly mistakes. My goal is to help you avoid these costly mistakes.

In an accompanying article (see "When to use different Active Directory models," at left), we provide an overview of Active Directory and its specific structural components. As a starting point, anyone involved in architecting or administering Windows 2000 should understand that Windows 2000 was designed to take into account both logical and physical structural parameters. These structures involve the organization and communication of data, respectively. Both should have equal weight in the planning process.

Planning is often regarded as "fluff" and rarely has a lot of sex appeal. Yet, failure to plan the Windows 2000 infrastructure and rollout can be very costly. As part of this effort, remember that organizations are dynamic and have constant shifts in mission, personnel and technology. ▀

For the full text, visit www.Windows2000-Advantage.com.

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For more inside, hands-on
Windows 2000 information, go to

www.Windows2000Advantage.com

GO

MARK HALL

Go soft on Bill

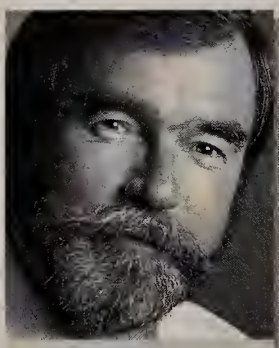
YOU MAY THINK I'M CRAZY, but Judge Thomas Penfield Jackson should let Microsoft go scot-free. After all, he acknowledges in his ruling that he knows of no "abstract or metaphysical assumptions" by which to define a product and a market under the control of a monopoly. You must, he wisely counsels, review each situation. In Microsoft's case, Jackson found one. Yet, by his own logic, the monopoly didn't exist until he defined it.

Microsoft is now betting that other jurists in the appeals process will define it differently. Just as you or I probably do.

In finding Microsoft guilty, Jackson dwells on how ruthless the company was to competitors, especially those that threatened to lure away its revered developers. Microsoft did everything in its considerable means to attract and hold on to those programmers and systems designers.

Only in retrospect, in our new Jackson-defined era, can those activities be seen as illegal. In other words, Microsoft didn't know it was a monopoly until last week's decision. It lacked any comprehension that it acted unlawfully. What I'm suggesting is a corporate version of the insanity defense. The company wasn't in the same reality as Jackson and the rest of us. So it can't be blamed.

Hence, I strongly suggest that any punish-



MARK HALL is Computerworld's West Coast bureau chief. You can contact him at mark_hall@computerworld.com.

ment sought by the prosecution, the 19 states and the 101 lawsuits be set aside. There should be no more talk of breaking up the company or forcing it to conduct business in a particular way. I suggest a deal wherein Microsoft simply remains Microsoft.

What Gates has to accept is that Windows is a monopoly product in the Intel desktop market. And any future actions the company takes will be seen as those of a monopolist. Gates would be free

to run a successful and legal monopoly — a fantastic management challenge. Or he could break Microsoft up as he saw fit, not as the DOJ thought right.

This strikes me as a sane proposal that will save the industry unnecessary turmoil during an endless and uncertain appeals process. Alas, Gates & Co. so far refuse to accept the reality of being a monopoly. Which brings me to a different insanity defense. ▀

DAVID MOSCHELLA

Everyone comes out a loser in Microsoft ruling

BOTH MICROSOFT and the Department of Justice (DOJ) will likely rue the day that they failed to reach a just settlement and forced the antitrust process to move forward. Sadly, this result wasn't really surprising. Microsoft has consistently failed to manage this critical case in anything resembling a statesmanlike way. Similarly, government lawyers, especially the attorneys general for the 19 states involved in the case, seem to have forgotten that the public interest called for a solution, not another whipping boy.

Although the exact settlement negotiations remain secret, it appears that neither side was willing to make the required compromises. But what makes this failure so unfortunate — and unnecessary — is that, despite what you often hear, the challenge wasn't that difficult. The parties had plenty of time to design an effective settlement that wouldn't unfairly impair Microsoft's ability to compete.

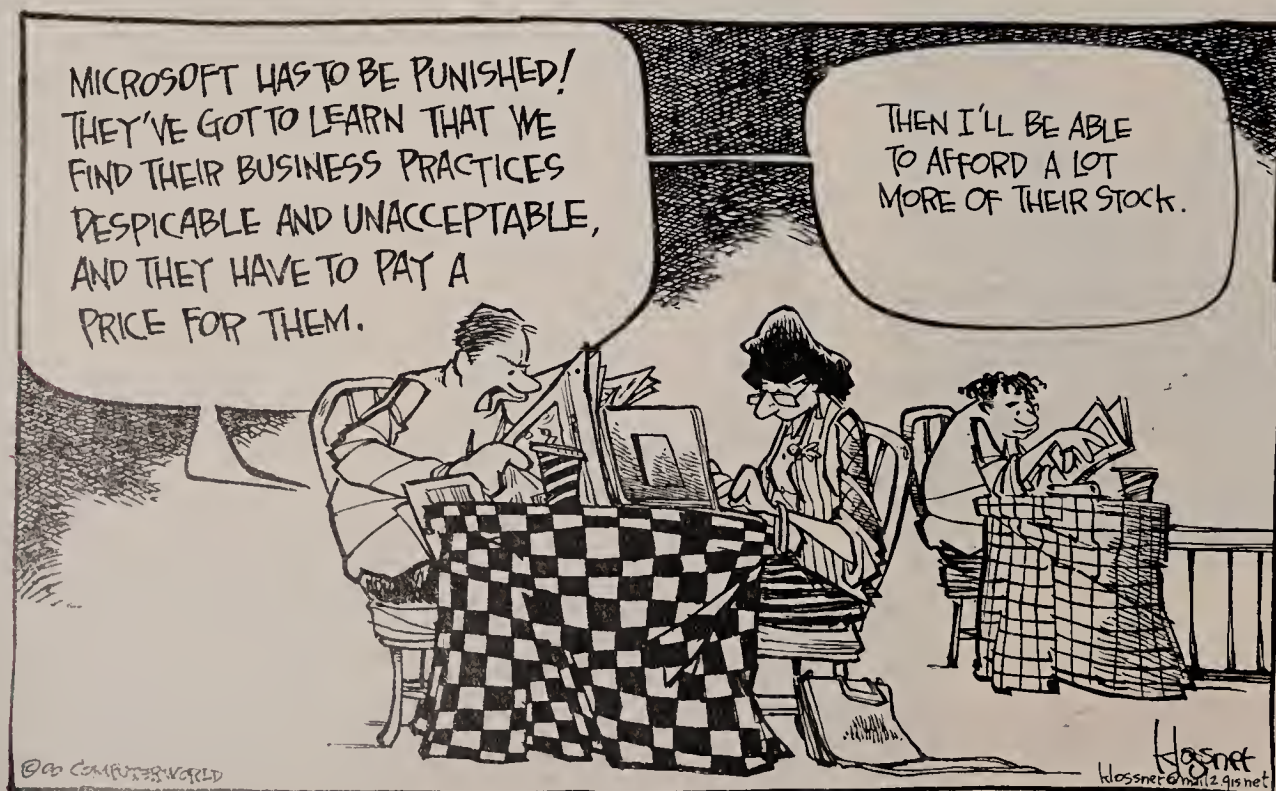
Fundamentally, this case has always been about three main issues: behavior, bundling and pricing. Of these, modifying Microsoft's behavior remains the most straightforward. Ideas such as making the Windows source code public, banning certain operating system contract requirements and insisting upon standardized Windows pricing would have gone a long way toward curbing Microsoft's most objectionable tactics, without seriously damaging the company.

The issue of which new software features should or shouldn't be bundled into Windows is certainly more complex, but it's not exactly the riddle of the Sphinx. The problem here is that Microsoft continues to want to have things both ways. It wants to be able to say that browsers, streaming media, speech recognition and the like should be part of Windows, but it also wants to make them available separately, to run on older Windows versions.

This self-serving position remains Microsoft's Achilles' heel. The government should support Microsoft's view that determining which features are part of the operating system should be entirely Microsoft's call. However, the DOJ should insist that a new function can't be both a separate



DAVID MOSCHELLA is vice president of knowledge strategy at Meansbusiness, an Internet start-up that's building a database of ideas. Contact him at dmoschella@earthlink.net.



application and an operating system feature. In other words, if a new feature is deemed an integral part of Windows, then it can't be made available separately for older Windows versions. Given this choice, Microsoft would think twice before requiring its supposedly cherished operating system integration.

But in the end, the entire antitrust case comes down to pricing. Can Microsoft decide which of its products to give away and which to price separately? Giveaway pricing was clearly the main strategy Microsoft used to wipe out Netscape, and it's definitely what current and would-be Microsoft competitors most deeply fear.

Here, however, it's the government that has to give. The reality is that giving away software is now inseparable from everyday Web-based competition. It's simply inconceivable that some judge or bureaucrat will be able to determine when Microsoft's prices are too high, too low or, somehow, just right. Indeed, when faced with free software from Microsoft, competitors have three tough choices: provide sufficient functionality to justify their prices, align themselves with enough financial backing to match Microsoft's pricing or suffer the consequences. There just isn't much that the government can or should do.

But, for now at least, these types of sensible compromises are dead, and instead of a useful settlement, we face the likelihood of a lengthy appeals process, frivolous private lawsuits and the demonization of a great and important company. Microsoft has only itself to blame for losing so much control over its fate; but, unfortunately, the government and the public have become losers as well. ▀

ALLAN E. ALTER

Knowledge management's 'theory-doing gap'

SHELL OIL CO.'S Scott Beaty is the kind of conference speaker who makes attendees feel they've gotten their thousand bucks' worth: the experienced, successful, seen-and-read-it-all manager that other managers admire. So when this knowledge manager told a Conference Board audience, "I've seen absolutely nothing new in theory for three years," something is wrong. What's wrong is the "theory-doing gap." I've borrowed the phrase from Stanford Business School professor Robert Sutton, whose book *The Knowing-Doing Gap* (Harvard Business School Press, 1999) discusses why managers don't do the things they know they should do. The theory-doing gap is the gap between academics who create theories, technologists who build systems and practition-

ers who try to make them work. It's a doozy.

Gap: Knowledge-management managers say researchers are wasting their energies trying to measure something as intangible as the value of knowledge. On the contrary, say researchers like University of California at Berkeley marketing professor Rashi Glazer — bottom-line-conscious CEOs and chief financial officers won't take knowledge management seriously unless someone finds a way to do so.

Gap: Practitioners say the most successful knowledge-management projects have narrow, precise goals, yet IT consulting firms that compete to be "thought leaders" keep building enormous systems for gathering and storing knowledge.

Gap: IT people think of computers as the core of knowledge management, while thinkers like Xerox Parc's chief John Seely Brown and Boston University professor Tom Davenport say we really need to focus on how people behave with information.

Meanwhile, knowledge management gets more lip service than results. A just-published Conference Board survey of 158 Fortune 1,000 compa-



ALLAN E. ALTER is the editor-in-chief of MIT Sloan Management Review and a former Computerworld editor. Contact him at alter@mit.edu.

nies found that 80% of them have knowledge-management programs under way, but only half of them have a knowledge-management staff or budget. And just 13% of respondents said their CEOs "get it." And most practitioners feel there still isn't a good definition for *knowledge management*, despite all that's been published.

What's a movement to do? Measuring bottom-line benefits is one way to gain respect for knowledge management. But there's more.

In science, the biggest advances in theory usually come when researchers tie together phenomena that don't fit the current scientific paradigm. The theories of relativity, evolution and continental drift changed the way we see the world because they explained phenomena that earlier theories could not.

Knowledge-management researchers — and IT strategists — should take a tip from Einstein, Darwin and Alfred Wegener and start looking for surprises and unsolved mysteries. Find the unexpected successes when a knowledge-management undertaking becomes accepted, despite initial opposition. Look for the unexpected failures when a project that enjoyed every advantage goes down the tubes. Search long and hard for patterns that don't make sense and happenings that shouldn't happen. Then develop a theory that ties the surprises together. That's the way to get people like Beaty to say, "You're on to something new," and close knowledge management's theory-doing gap. ▀

READERS' LETTERS

Mixed meetings

ON TAPSCOTT'S column "Meeting Online Can Save Money, Boost Productivity" [News Opinion, March 6] clearly pointed out the advantages to putting a conference online for both the speakers and attendees. I've attended and offered seminars and classes online, and my experience is mixed.

Available technologies vary considerably in their capabilities and quality. While I can be tolerant of poor quality when it saves travel, it can distract, as both presenters and participants instead focus on the delivery technology.

The session Tapscott presented was asynchronous, with people listening at their convenience and asking questions that Tapscott responded to at his convenience. Personally, I find synchronous

presentations more compelling and easier to attend. I put them in my schedule and actually carve out the time instead of continually putting them off due to seemingly more pressing commitments.

I would have liked to have listened to Tapscott's presentation but would have preferred a real-time presentation with the opportunity to ask questions and get an immediate response.

Lisa Neal
EDS Web Universities and Training
Lexington, Mass.
lisa.neal@eds.com

Auto markets flawed

REGARDING CAROL Sliwa's article "Auto E-Market Faces Big Hurdles" [News, March 6], the greatest factor in building a computer-based market for auto compa-

nies isn't the tools available, but the process philosophies that drive the companies when procuring supplies and services. As a contractor in the auto industry, I have repeatedly seen efforts to arrive at a common system die. Why?

For all of the talk of common systems, companies do not seem to want to let go of their methods. If the auto industry continues to pursue this idea of a common market with a "tools first" philosophy, you will probably see at least three or more e-markets.

Matthew A. Sawtell
St. Clair Shores, Mich.
matthew.sawtell@home.com

Look before jumping

LENNY LIEBMANN didn't mention an important point in his column "Jump on the Instant Messaging Bandwagon" [News

Opinion, March 13].

If you are using a commercial instant messaging service, for example, AOL Instant Messenger (AIM), be aware that your message will leave your corporate network and travel to the AIM server in plain-text mode before being forwarded to the recipient. It isn't encrypted or protected in any manner, and most likely a copy will remain in a file on the server for some period of time.

Gerald A. Gosewehr
Warrenville, Ill.

More Letters, page 36

COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

UCITA: Unfair? Or essential to business?

EDITOR'S NOTE: Virginia last month became the first state to adopt the controversial Uniform Computer Information Transactions Act (UCITA), which sets rules governing the transactions of commercial software and digitally transmitted information. From 1996 to 1999, the National Conference of Commissioners on Uniform State Laws (NCCUSL), which recommends commercial code law, held public hearings on UCITA. The NCCUSL adopted it last July and sent it to the 50 states for adoption. Only a handful of states have introduced the measure.

J. DOUGLAS KOELEMAY

UCITA offers clear guidelines

CRITICS OF UCITA argue that it's big, complex and moving too fast and that it works to the detriment of everyone except a small number of software companies. But three points suggest otherwise.

First, UCITA isn't a government dictate. It's a set of default rules that apply if a vendor/user contract has none. Nothing in the act forces any business or consumer to accept any term of a contract. Customers remain free to negotiate their own terms. The bottom line: If you don't like UCITA, don't agree to a contract with its terms.



J. DOUGLAS KOELEMAY is vice president of the Northern Virginia Technology Council (www.nvtc.org), a group of more than 1,300 high-tech companies.

Second, UCITA isn't a conspiracy; it's the future arriving today. Article 2 of the Uniform Commercial Code governs commercial transactions of tangible goods, but there's no comparable law for computer

information transactions and e-commerce. We need such a law, and UCITA creates fair and transparent rules in a number of critical areas to prevent confusion or a slowing of the digital economy.

For example, the "shrink-wrap," "click-on" or "mass-market" licenses referred to in UCITA aren't new, sinister practices. Rather, they are ways that thousands of IT vendors and user companies and millions of consumers already conduct their software and Internet businesses. This legislation brings clarity and predictability to these common electronic practices and anchors them in a new section of the commercial code.

The use of electronic agents and the download-

ing of software from the Internet are new ways of doing business that recognize the value placed on information itself. UCITA specifically recognizes

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all federal patent, copyright and intellectual property laws. It honors existing consumer protection laws and spells out new rights and responsibilities for businesses and consumers in our instant and interactive marketplace.

Third, UCITA is the opposite of a rush job. It's the result of years of the most deliberative process legislators have — the uniform state law commissioner process — in which attorneys from all 50 states study, weigh input, find compromises and draft new laws for legislatures to consider.

Unfortunately, the people who didn't get what they wanted during last year's drafting process still criticize UCITA. They don't like the consensus that has emerged. And they even ignore what customers gain.

With shrink-wrapped software, customers gain the right to a full refund if they don't agree with contract terms and warranties — even after opening the software. And, for the first time, they get implied warranties that the computer information they buy is accurate and that software will work with their systems. They also get a good-faith defense if they inadvertently click Accept.

Like good fences that make good neighbors, better e-contracts make for better e-commerce. UCITA is reasonable, balanced legislation that brings more clarity and certainty regarding the delivery of computer information and software. Virginia's delayed effective date for the law gives all parties time to continue to review its provisions and approaches taken by other legislatures. Ultimately, the best practices of all states on UCITA in the next few years will bring the greater uniformity in contract law we need to continue lowering costs, improving quality, boosting productivity and fostering innovation. ▀

JOHN F. RUDIN

It's bad news if you still buy software

UCITA MAY HAVE WON approval in Virginia last month, but the fight over this legislation, which overwhelmingly favors software licensors over the concerns of their customers, is far from over.

When the Virginia General Assembly took up UCITA in January, the influential software industry tried to convince lawmakers of the merits of the proposal. The industry argued that Virginia, as a prominent high-tech region, could

make a bold statement in passing the bill.

Not so fast! A coalition of businesses, libraries, consumer groups and various associations labored to present concerns and encourage further study of UCITA's potential impact on software users before enacting legislation.

The result was a compromise bill. Amendments were added to temper some concerns, require a committee to study UCITA, establish a technical advisory group of representatives from all involved parties, require a report by Dec. 1 and defer the effective date to July 1, 2001.

Virginia has clearly established a leadership position by enacting UCITA. The legislation — as approved with the user-friendly amendments — helps generate interest and comments for the effort to produce needed amendments prior to the start of the next General Assembly session in January. Enough opposition can prompt necessary change or further delay the effective date.

The risk is that without resolution of the many concerns, Virginia, in less than 15 months, may have a new law that helps less than 10% of its economy at the expense of the other 90% of industries that support the state.

Of course, the battle must still be waged in other states, which may wait and see what happens in Virginia. The UCITA study in Virginia, as well as other states' actions, will be crucial for software users, especially businesses. The consequences of unbalanced legislation will raise businesses' costs to negotiate, administer and litigate software contracts and disputes.

While vendors argue that UCITA serves only as a default contract law in the absence of negotiated terms, it overwhelmingly favors software licensors. The legislation creates a legal framework that, among other things, does the following:

- Shifts the balance of existing contract law in favor of vendors when they contract with businesses and consumers.
- Permits vendors to shut down mission-critical software without court approval and without incurring liability for the resulting harm.
- Allows vendors to prohibit the transfer of software from one company to another, even during a merger or acquisition, and limits consumers' access to information through libraries.
- Allows vendors to avoid liability for damage caused by defects known to the vendor — and undisclosed to the licensee — at the time the software was acquired.
- Allows vendors to include such unreasonable terms in agreements as prohibiting public criticism of their products.

If you think that negotiating with software vendors is already difficult and expensive, the outcome of UCITA may make things much worse. If you want an equitable contract law, let your state legislators know of your concerns and urge that the act not be adopted in its present form. ▀



JOHN F. RUDIN is vice president and CIO at Reynolds Metals Co. in Richmond, Va.

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READERS' LETTERS

Readers debate pros and cons of Internet sales tax proposal

IN PATRICIA KEEFE'S EDITORIAL "Tax Net Commerce" [News Opinion, March 6], she hit the nail on the head. The suggestion that taxes would stall the progress of e-commerce is absolute nonsense. People should be strongly objecting to the unfairness of one product delivery mode being taxed while others get off free.

If the Web needs to be free of something, how about political posturing on the sales tax issue?

David MacKenzie
Farmingdale, N.J.

THE PROPOSED SALES TAX on Internet sales is totally wrong. Its hidden agenda is to create a new federal sales tax that will only add to the tax burden of most people.

Ronald A. Sobieraj
Perth Amboy N.J.

PATRICIA KEEFE SHOWS a nearly complete lack of understanding of taxation. When a sales tax is levied, the tax is on the sale of the product, not on the product itself.

Under our system of taxation, whether at the federal, state or local level, it's literally impossible to tax a certain product, which comes under the category of property.

Also, the Constitution prohibits states from taxing exports (Article I,

Section 9, Clause 5). Most online business is conducted with the vendor and buyer occupying different states.

As for the oft-repeated drivel that all should "pay their fair share" or "carry [their fair share] of the load" — their fair share of what? A load of what? The real question of fairness is whether

anyone engaging in an enterprise that is lawful, innocent and harmless should have to render a "cut" to the public for exercising his right to labor. The courts in this country, including the U.S. Supreme

Court, have said no.

Unfortunately, politicians frequently ignore the rulings of the courts and prey upon the ignorance of the populace.

Darryl Depew
U.S. Department of Energy
North Las Vegas, Nev.

MY COMPANY is part of one of the Internet's largest commercial systems, Quixtar.com. Our customer service is exceptional, and because we have a "presence" in each state, we're required to collect sales tax in each state jurisdiction where one is assessed. Other start-ups and the many scams that populate the Internet don't pay those taxes.

I work with many cities, and they are being affected by their reduction in sales tax revenues. The public, on the other hand, seems to want more and better public safety services even though city sales tax revenues have decreased as much as 10%.

I personally support a national retail sales tax and the removal of the current Marxian income tax code, which then would make the playing field level for all to create the greatest economic boom in history.

William Prouty
Benefit Technologies International
Sun City, Calif.
wprouty@aol.com

PATRICIA KEEFE IS absolutely correct in that the real issue is customer service. Sure, it's nice to avoid sales taxes when I buy from Amazon.com, but if the company's service stank, I would avoid it like the plague.

In the same issue, Bill Laberis' column echoed the same theme — It's the service, stupid ["How to Mismanage Relationships With Your Customers," News Opinion]. That's what will, in the long run, make a company successful.

And then Frank Hayes points up the

danger of outsourcing ["Why Risk It?" The Back Page]. A good job!

Al DeVito
Vice president of marketing and chief operating officer
Data Kinetics Ltd.
Ottawa

Study India's example

MICHAEL Cusumano's advice to "study how India has made progress so quickly in software quality" ["'Made in India' a New Sign of Software Quality," News Opinion, Feb. 28] would be a good assignment for both novice economists and management students.

Jaganadha R. Karra
Alexandria, Va.
jkarra@usa.net

Does IT really need business?

PAUL STRASSMANN'S OPINION ["Fighting the Jobs Gap," Business Opinion, March 6] is an educational but laughable look into the mind of a business person.

He speaks of IT people like cattle that should be priced by the pound. He seems to feel that the tail is wagging the corporate dog and it must stop because that is not how things should be.

It's supposed to be that business people are paid more and get more perks than any of the technical people, even though business people don't actually create anything, just cheapen it, skim the profits off the top and take the credit for invention.

Strassmann should start getting comfortable standing in the unemployment line, because, speaking for IT people everywhere, we are discovering we don't need the business people.

By running companies without the expensive overhead of pampered executives, there is more money to put back into the company and into the pockets of employees.

Mark Keilp
Sturbridge, Mass.
mjk5@meganet.net

Thanks, Bill

FRANK HAYES' article ["Win 2k or Win 63k?" The Back Page, Feb. 21] makes quite a statement about the oft-unappreciated work of the IT department.

Consider this: "63,000 'potential known defects' — bugs, design problems, you name it — are still unfixed in the shipping version of Windows 2000." And we'll have to support this software. Yikes.

Chris Quigley
Systems/network administrator
Quantum Bridge Communications
North Andover, Mass.
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BUSINESS

WEB APPROACH TO WEB BUILDING

When the founder of HoustonStreet.com first envisioned an online exchange for electric power, he knew time was of the essence. So he wove together the best and brightest vendors he could find, got out of their way, let them do their magic and had a finished project four months later. ▶ 40

PIRACY PROMO

Could a little bit of piracy be good for business? Glassbook, the distributor of Stephen King's electronic novella, used weak encryption so as not to delay the book's release. Others say it was simply smart marketing. ▶ 40

NEW TOOLS FOR BENCHMARKING

Analyzing the effectiveness of business processes supported by R/3 systems can be complex and costly. But SAP and other software vendors are creating new tools to help automate that task. ▶ 42

DECIMAL DELAY

Nasdaq, struggling to deal with record-high trading volumes, may not be able to install a new decimal-based stock trading system until the first quarter of next year, delaying the decimalization of the entire securities industry. ▶ 46

READY, SET, GO

The new rule of business is to get products

out the door as fast as possible, says Peter G. W. Keen. And IT departments, which no longer have time on their side, must learn to adjust — now. ▶ 48

COMMUNITY BUILDING

A few years ago, online communities were all the rage. They still provide a strong edge for companies by helping to build trusting relationships with customers. But are they worth it? ▶ 50

TAPPING TOP IT TALENT

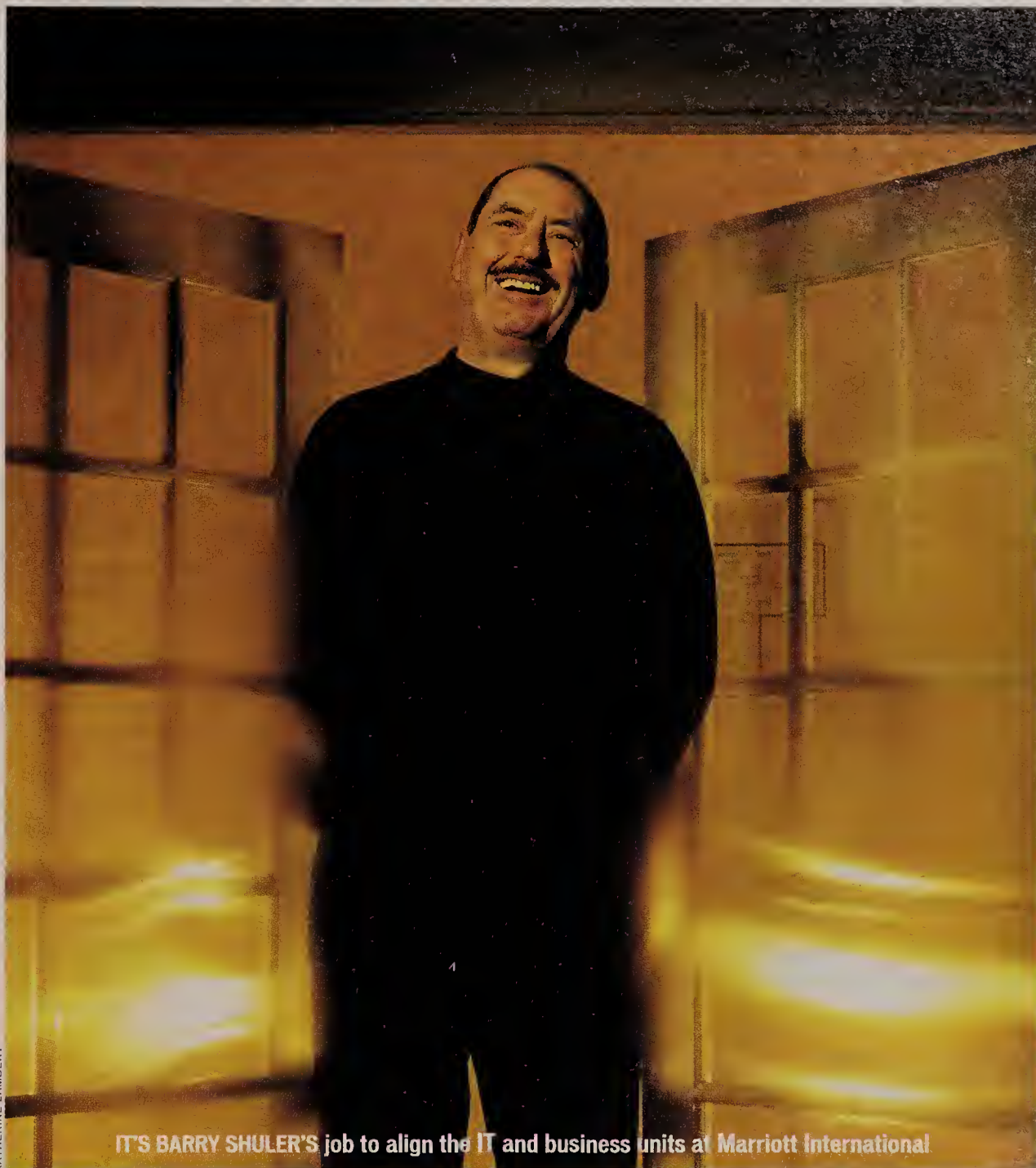
How do you recognize talent? And what can you do to foster and develop that talent? IT leaders at Dow Jones, the Red Cross, Staples and Home Depot share tips on how they spot and keep quality staff. ▶ 52

PARTNERS IN CYBERSPACE

The Web has changed the rules of the workplace. No longer can the business side or IT side call the shots by themselves. In order to succeed, they must learn to work in tandem. ▶ 62

SIGNING OFF DIGITALLY

One of the biggest threats to online business is identity theft. Digital signatures are one way of making sure people sending messages really are who they say they are. See QuickStudy. ▶ 64



IT'S BARRY SHULER'S job to align the IT and business units at Marriott International

ALL FOR ONE AT MARRIOTT

MARRIOTT HAS PLACED a special focus the past three years on aligning its IT group with its business goals. It's a move that many say is critical in the 21st century. Company leaders at the hospitality chain also say that erasing boundaries between the IT and business sides was a crucial step in making the company the most admired player in the hotel business.

58

Want Speed? Hands Off!

Power exchange lets vendors build site with little supervision, but gets online fast

BY JULIA KING

AT THIS TIME last year, Frank Getman, president of Houston Street Exchange Inc., knew next to nothing about how to build and launch an Internet-based trading exchange for electric power.

What he did know is that speed, not glitzy technology, is usually what differentiates winners from also-rans on the Internet. He also knew that to be first with an online power trading floor — a replacement system for brokers who traditionally buy and sell blocks of power by fax and phone call — he had three, maybe four months tops.

To get the job done, Getman came up with what he calls a “web for the Web,” a project team composed of four outside vendors, all of which signed confidentiality agreements and a contract to work together

er — frequently without any input from their client.

The idea, Getman said, was to “hire the best and the brightest — a kind of mini-keiretsu — then get out of their way.”

The other guiding principle behind what would soon become HoustonStreet.com was “do first things first and second things not at all.” That’s how projects like Operation Avalanche, a marketing project to drive traffic, rose to the top of the priority list.

It’s also how the trader community project Operation Kumbaya got scrapped, at least in the initial version of the exchange, which was launched last July, after less than 125 days of work.

Today, 425 traders use the exchange, which is now branching out into trading crude oil, natural gas and other forms of energy.

“It’s a business model that allows you to achieve speed

to market,” Getman says.

The major project partners HoustonStreet.com hired include Cambridge, Mass.-based Sapient Corp., which is developing the trading applications and other core software; Portsmouth, N.H.-based MicroArts Corp., to create the user interface and do other branding work; Bowstreet, also based in

Portsmouth, which is creating XML-based schemas for different vertical markets within the energy industry; and Beaupres & Co. Public Relations to promote the new company to the press and analysts.

Getman said he picked all of the partners primarily for their expertise, not their workstyles. “But I told the partners they wouldn’t get a contract unless they did work together,” he said.

“Frank knew from the beginning that HoustonStreet could not sit in on every meeting and every decision, so he empowered partners to make deci-

sions,” said Ed Dragon, Sapient’s director of client relationships. “HoustonStreet didn’t put itself in the middle of every conversation, and that’s really where you got your speed.”

Early on, for example, Sapient and MicroArts decided that people on the project from MicroArts would work out of Sapient’s offices and use Sapient e-mail addresses and phone facilities.

Tom Zikis, general manager of the project, attributes its success to a decision to divide the effort into 17 smaller projects, which were easier to track and complete.

This was accomplished by thoroughly scoping each of the smaller projects and having each party commit to what it could accomplish individually and identify where it needed help. Deadlines were set at scoping, Zikis said.

Partners said the project’s strict time line, coupled with a payment scheme that tied a percentage of the partners’

compensation to their performance as a team, created a working environment in which failure was just not an option.

“You’d find yourself in a conference room with folks you’ve never seen before and you’re not sure how you’re going to work together, but you have to figure it out,” said Andy Palmer, a Bowstreet vice president. Trust was critical, Palmer said. Each partner had to trust the others’ expertise on specific issues that would have a significant impact on his own piece of the project and, ultimately, his payment.

Since then, Palmer said, Bowstreet has adopted a variant of Getman’s web-for-the-Web project management approach with several other clients.

“More and more, this is a model that will evolve [because] e-business projects require a much broader scope of knowledge,” said Jim Highsmith, an analyst at Arlington, Mass.-based Cutter Consortium and author of a book on collaborative software development.

“People need to be cognizant that things like this do increase risk, but in light of speed-to-market requirements, that increased risk is justified,” Highsmith said. ▀



GETMAN: Hire the best and “get out of the way”

E-Book Piracy Doesn’t Frighten Publishers

Some see incident as savvy marketing

BY CHRISTINE MCGEEVER

Those who stand to lose revenue from electronic-book piracy are being remarkably stoic in the face of the first high-profile incident.

While the recording industry is up in arms about piracy, the book publishing industry apparently sees it as a good marketing strategy.

Within days of the March 14 release of *Riding the Bullet*, Stephen King’s 66-page electronic novella, someone cracked the encryption that protected the content of the book. After it was downloaded and opened in a software-based reader, the material showed up on the Web.

But the security breach wasn’t much of a surprise to *Riding*

the *Bullet* distributor Glassbook Inc. in Waltham, Mass.

Because of the rush to release the book, Glassbook knowingly used a reader equipped with less-than-robust encryption, which made the content vulnerable to piracy, according to Glassbook President Len Kawall.

Piracy of downloadable music content from MP3.com Inc. has resulted in lawsuits, police searches and seizures, and criminal charges against accused crackers. But King’s publisher has no plans to pursue charges against the perpetrators.

“These things happen,” said Simon & Schuster Inc. Online Publisher Kate Tentler. “It’s the usual Web behavior. It was kids.”

New York-based Simon & Schuster initially tried to downplay the incident to avoid the appearance of “issuing a

challenge” to crackers, said Tentler. But the company is highly concerned about the piracy of electronic intellectual property, she added.

At the same time, publishers and sellers also want electronic books to be inexpensive to purchase and easy to download and read. The trick is to strike a balance.

“In book publishing, a little bit of piracy may be good marketing,” said Chris MacAskill, CEO of online electronic publishing sites Fatbrain.com Inc. and MightyWords.com Inc. in Santa Clara, Calif.

Electronic-book publishers don’t stand to suffer much financial damage since electronic distribution cuts out the most expensive and time-consuming parts of producing a book: printing and shipping.

Overall, MacAskill said, electronic publishing cost savings are seen to outweigh the

risk of minor piracy incidents because the new strategy eliminates the traditional publishing industry middleman — the printer — which accounts for 40% of costs.

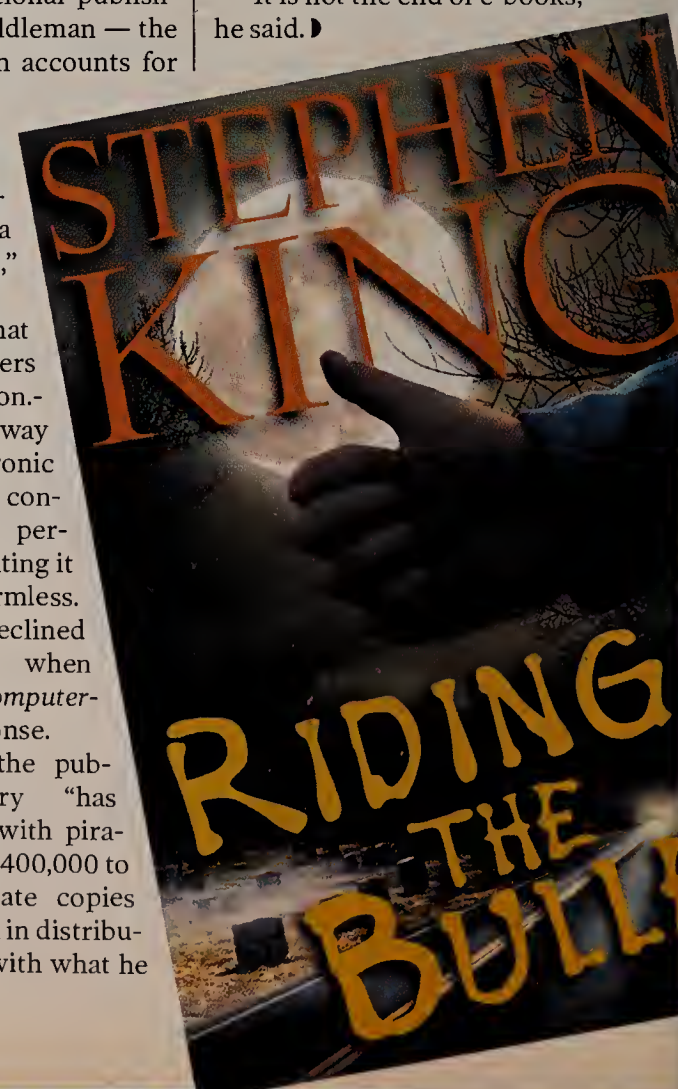
“E-matter disaggregates all of that. Customers get a cheaper product,” said MacAskill.

The fact that online booksellers such as Amazon.com Inc. gave away the King electronic book may have contributed to the perception that pirating it would be harmless. Amazon.com declined to comment when asked by *Computerworld* for a response.

Kawall said the publishing industry “has learned to live with piracy.” He cited the 400,000 to 500,000 legitimate copies of the King book in distribution compared with what he

estimates to be “a few” pirated copies.

“It is not the end of e-books,” he said. ▀



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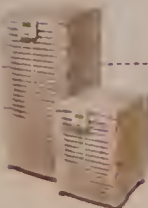
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New Benchmarking Tools Planned for R/3

Will help businesses analyze effectiveness

BY CRAIG STEDMAN

Lockheed Martin Corp. can automatically capture information on how the business processes supported by its SAP R/3 system are set up. But analyzing their effectiveness isn't nearly as easy.

Benchmarking how quickly the Bethesda, Md., company's operating units can process purchase orders and perform other business tasks is a costly undertaking that requires lots of manual labor, said Dick Beckman, an enterprise resource planning program manager at Lockheed Martin.

Consequently, those measurements are typically done

only "in a very selective way," Beckman said. That makes it hard for business managers to figure out how well the R/3 system is being used, he added.

But SAP AG and other software vendors plan to address the problem. On the way are new tools that are supposed to automate the process of measuring how SAP's applications are used from a business standpoint and let users compare themselves with other firms.

For example, German vendor IDS Scheer AG is beta-testing software that can pull business-process measurements out of R/3 and stack them up against internal goals. The tool is due this spring and will be used by SAP as part of a year-old service aimed at helping R/3 users measure the return on their investments.

JUST THE FACTS

Measuring R/3

What's at stake: The way R/3 users design business processes supported by the system can be crucial to the success of ERP projects. Tools for analyzing the effectiveness of processes are just emerging.

What's coming: Software that can measure order processing times and other business metrics and compare results with internal goals and industry benchmarks compiled from multiple users.

Potential roadblocks: Vendors need to deliver the tools and persuade users to share business-process data with other companies, including competitors.

IntelliCorp Inc. in Mountain View, Calif., is also developing a business-process analysis tool that's due for controlled release this summer. IntelliCorp and IDS Scheer both said

they plan to use the Web to publish business-process results from multiple companies for benchmarking purposes.

Lockheed Martin, which already uses business-process modeling tools made by IntelliCorp, hasn't committed to buying the upcoming analysis software. But Beckman said the technology could make it more practical to measure how effectively the firm is using R/3.

The aerospace and defense manufacturer could then compare results across its 17 business units and try to improve any that don't measure up, Beckman said. External benchmarking against other users might also be helpful, but IntelliCorp "needs to get companies to take part," he said. "Then we're going to know how close the vision is to hitting reality."

Tony Lacy-Thompson, vice president of marketing at IntelliCorp, said business-process benchmarks would be posted

on the Web anonymously and would include only the actual results, such as the time it takes a company to enter an order. How business processes are set up wouldn't be disclosed.

Even so, getting R/3 users to share that information with rivals won't be easy, said Pierre Mitchell, an analyst at AMR Research Inc. in Boston. "There's no way people are going to let go of that data," he said.

Robert Rubin, who left his job as CIO at R/3 user Elf Atochem North America Inc. in Philadelphia earlier this month, said giving other chemical manufacturers a look at the internal workings of Elf Atochem wouldn't have been high on his priority list.

"I don't see the value of telling the competition what we can do so they'll know what to shoot for," Rubin said. "The major thing for us was to see what a customer expected and then try to beat that." ■



Here's to a faster Web site: the Compaq TaskSmart C-Series server.

Handhelds Help Reuters Sales Force Track Competition

Server sync gives control and security to financial firm

BY MATT HAMBLIN

Reuters Ltd. sales executives in Spain are supposed to gather information about competitors in the field, but the way they collected the information — on handheld computers that uploaded information through PCs to a client database — was creating major administrative headaches for the company's information technology department.

The Reuters Madrid office is trying to simplify this problem by synchronizing the Palm Inc. Palm V handhelds through a server, rather than through

PCs. Salespeople plug the units into synchronization cradles and upload the data to a server running XTNDConnect synchronization software from Boise, Idaho-based Extended Systems Inc. The server then moves it into an Oracle Corp. database.

The sales updates are considered critical to staying competitive in the fast-paced global financial products marketplace, Reuters officials said. The pilot project will soon be expanded throughout parts of Europe, eventually reaching more than 200 users.

"It is important for us to be able to gather information about the competition in the field and mark down quickly what the competition is doing," said Miren Polo de Lara, IT manager for the Palm/Con-

tacts Manager project, based in Madrid. "We gave the sales executives a tool they could use easily and without much extra work."

The database includes information on competitors as well as customers and products. Reuters chose XTNDConnect partly because it links several databases to several platforms: the Palm operating system, Windows CE and Epoc by Symbian Ltd.

The password-controlled database also controls access to data, Polo de Lara said.

Cost vs. Benefits

During meetings with brokers, financial advisers or others, salespeople use clickable forms and pen entry on the Palm Vs to update contact information. They can even keep

track of which competitors' products Reuters customers are using.

Moving synchronization from



MIREN POLO DE LARA: "We gave the sales executives a tool they could use easily and without much extra work"

the PC to a server is the key to keeping control of valuable data, as well as centralizing administration of the notoriously hard-to-monitor devices, said Peter Lowber, an analyst at Gartner Group Inc. in Stamford, Conn.

"I think it is easy to use," said Manuel Pineda, one of the Madrid-based sales executives using the system. "With one tick only, you can collect information on what your users are more interested in, what competition they have or what things you have to remember after a meeting."

Three executives in Madrid took part in the initial pilot test, and another nine will start using the system this month. Sales teams in France and Belgium will join in later. Software and hardware costs for the first 12 have totaled \$15,000, which Reuters considers "negligible, compared to the business benefits," Polo de Lara said. ▀

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SEC May Bend on Decimalization Deadline

BY MARIA TROMBLY

The Nasdaq Stock Market Inc.'s warning that it won't make the July 3 decimalization

deadline may prompt the Securities and Exchange Commission to set a later date.

SEC Chairman Arthur Levitt

said he was "dismayed and disappointed" by Nasdaq's request to delay the switch from fraction to decimal stock pricing but added that the SEC is likely to extend the deadline by one or two months.

The SEC is "working to accomplish decimalization as expeditiously and as safely as possible," said John Heine, a

spokesman for the agency.

Nasdaq, which has already been struggling with increased trading volumes as a result of the jump in the number of technology stocks, said it won't be adequately ready for decimalization until the first quarter of next year.

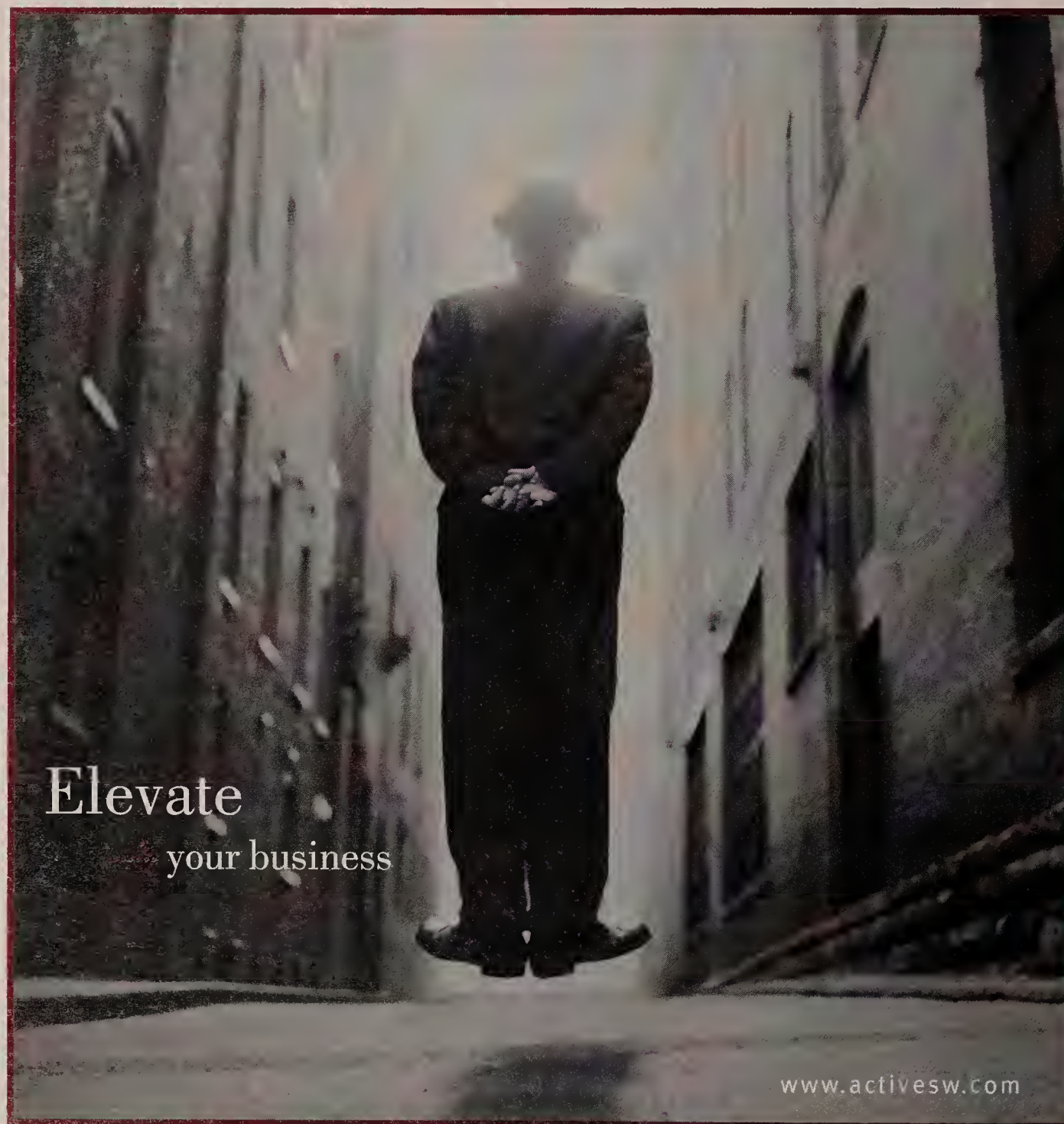
The exchange's major concern is the increase in trading and quote traffic that decimalization is expected to cause, since decimal prices can be quoted in increments as low as 1 cent. Fraction-based reporting permits prices only as low as one-sixteenth of a dollar, or 6.25 cents.

The exchange was ready to release the first version of its new trading software last year, but testing showed the software wouldn't be able to handle the expected high volume of traffic, said Nasdaq CIO Gregor Bailar.

If the decimalization deadline isn't extended, Nasdaq will be forced to release that version, which could cause the system to crash, say analysts.

The first version of Nasdaq's Integrated Quotation Management System (IQMS) was built based on the expectation that trading would peak at 2 billion shares per day, but the exchange is already averaging that amount. IQMS now needs to be able to handle as many 2.5 billion to 3 billion shares daily, said Bailar.

To deal with the problem, Nasdaq began working on Release 2.0, which will support 3 billion to 4 billion shares by splitting the work among different machines, he explained. Its targeted release date, though, isn't until the first quarter of next year. ▀



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Keeping Up

Decimalization is just one way exchanges have changed to keep up with increasing streams of money from investors. Change in dollar volume* of the major markets, 1990-99:

Nasdaq:	1,876%
NYSE:	515%
London:	475%
Deutsche:	171%
Tokyo:	14%

* NOTE: FIGURES ARE NOT ADJUSTED FOR INFLATION

SOURCE: INTERNATIONAL FEDERATION OF STOCK EXCHANGES, NOV. 30, 1999



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WORKSTYLES

What It's Like to Work at . . . VF Corp.

Interviewee: Joe Plaster, vice president of electronic-business technology. He was promoted to the position March 14 from director of common systems technical support.

Company: VF Corp. (www.vfc.com), a clothing company comprising the brands Lee Jeans, Jantzen, Vanity Fair Intimates, Jansport, Wrangler Jeans and others. Its newest acquisition is Eastpak.

Main location: Greensboro, N.C. (45 minutes west of Research Triangle Park)

Number of information technology employees:

About 600 nationwide. The centralized shared services group in Greensboro has about 200 people. IT and shared services staff are dispersed throughout all the business units.

Number of employees (end users): 66,000 to 70,000

Tenure: 10 years total over the course of 15 years. "I've worked for VF three different times."

Why did you keep coming back? "I had left the first time because I wanted to expand my horizons. I came back because VF, from an IT standpoint and from an apparel industry standpoint, is a leader in using technology to drive business processes. And I had to wear a coat and tie in my other jobs."

Dress code: "The VF business casual products. Levi's would certainly be frowned upon."

What did your job entail before your promotion?

"Technical and infrastructure support for the suite of applications that we use across the company, including the i2 supply-chain planner, SAP R/3, Logility Forecasting and [Gerber Technology Inc.'s] Web [product data management] apparel industry software."

Describe the new job: "The focus is to extend our common systems architecture out to our retail partners, customers, suppliers and vendors. We want to be more collaborative with them, and we're also planning more business-to-business e-commerce transactions, like enabling a swimsuit [retail] buyer to order Jantzen suits. And we will be an anchor tenant, along with i2, in SoftGoodsMatrix.com, a

dynamic e-marketplace for collaboration with retail partners. It will allow procurement services with our vendors and suppliers, for instance, or sharing retail forecasts."

Workday: 8 a.m. to 5 p.m.

Really? "Well, in my new job I have a lot of meetings to attend, and that always means I have a lot of catching up afterward, so I'm coming in about 7:30 a.m. and

working until about 6 p.m."

Employee-review process: "We get reviewed as part of the salary review administration process, which is once a year or whenever it's necessary to make an adjustment. There's movement available here — we have so many different projects that offer visibility and diverse career paths."

Security badge or card needed to get into the building or office? Yes. All the doors have security-card readers.

Kind of offices: "The shared services group is in a former bank building with a huge atrium in the middle. It doesn't lend itself to cubes, so we're mainly in offices with big 8-by-8 windows."

Must people carry beepers? Cell phones? Yes, most do.

"I have both at the moment, but we have some new cell phones that I hope will allow me to get rid of my pager."

Percentage of staff that telecommutes: 1% to 2%

Any on-site amenities?

"I think there's a subsidy for a local health club."

The one thing everyone complains about: "Getting calls in the middle of the night"

Little perks: Employee stores, annual company picnic, IT outings such as bowling, "and one of our business units provides company-branded apparel, so we have gotten some VF apparel or shirts with project logos."

Would employees feel comfortable e-mailing the CEO? "My guess is that they would be. It would have to be a personal decision."

Quote: "We have a lot of technology available to us. It's very exciting, and we face a lot of challenges." — Leslie Goff



Six months — or else

PETER G. W. KEEN

WELL, IT HAS FINALLY HAPPENED. Large-scale software is being delivered on time and under budget. More important, a development project now sets 90 days for the key first deliverable and no more than six months for full implementation, and there's no time wasted prototyping — you go straight into full design.

If you're an information technology professional who has heard all this before and is ready to dismiss this as more consultant BS, please don't. (One IT manager recently called me a liar when I presented figures on what's happening in company after company.) This is real, and it requires IT to radically shift every aspect of its own operations. When major new business-to-business hubs and e-commerce consumer sites are built in 90 to 180 days, there is absolutely no way that IT can stick to the marathon-run timetables of the past.

I periodically take top management teams from my client firms "on safari" to Silicon Valley and to what I call the Washington Internet command center — the area of Washington, Maryland and Northern Virginia, where the next generation of Internet innovation in business, public policy, telecommunications and media is centered. I keep my own ears on alert for the next "Wham!" that will clearly signal that a major shift is coming in technology or business for everyone. Two years ago, it was the now-obvious explosion of business-to-business e-commerce. Last year, it was application service providers and wireless tools nearing mass rollout.

This year: Wham, wham and wham! I returned from safari in March, my notebooks packed with case after case of the 90-day-to-delivery rule. Sun Microsystems, Ariba, BroadVision, HP, KPMG, Monterey Network Center and Celosis, all suppliers of tools for business innovation, gave me dozens of instances of Fortune 1,000 companies and dot-coms that moved from development of a business model to operation that quickly.

The new basic business assumption is that this now has to be the case. A company no longer has time on its side, and executives now insist that the key issue is to get something out fast, even if it isn't complete in the traditional sense of full systems requirements. That's why

there isn't any more prototyping. The rule is: We need it up and running fast, and we'll fine-tune it as we go; what can you give us? This is a fairly universal shift in the companies that recognize that the business question isn't whether or not to innovate but how and how fast.

"Fast" means the assembly and reuse of tools rather than building systems from scratch. Everything now is component software, plus application programming interfaces, plus plug-and-fix, plus real and committed partnering. And suppliers recognize this. The new offer from a supplier goes like this: "We don't do that piece ourselves, of course — integration with legacy systems, databases and enterprise re-

source planning — but here are our partners who do. Let me tell you about one of our clients — Household Name ABC — that we got up and running in 10 to 12 weeks." I must have heard that even more often on our safari than the phrase "stock options."

One company we visited is among the top 20 technology providers. Its IT function has an interesting business model: no programmers or programming and no \$50 million systems-development proposals — \$2 million is the limit. This forces business and IT to cooperate in new ways. It makes development fundamentally a process of prioritization — the 90-day pressure — and of alliances. Firms like Ariba and BroadVision have superb technologies with big gaps. Those gaps are filled by systems integrators, professional service firms and even by collaborations with competitors, called "co-opetition."

This is the reality that IT must respond to. It needs a new business model to help the business implement its business model — fast. ▀

*A company
no longer
has time on
its side.*



Keen is chairman of Keen Education, as well as an author and consultant. His Web site is www.peterkeen.com, and he can be reached at peter@peterkeen.com.

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GURL.COM'S HEATHER MCDONALD and iTurf.com's Oliver Sharp say the toughest part to growing a community is giving users what they want, while keeping them in line



Do Communities Pay?

Online communities can help establish relationships with potential customers, but it remains to be seen whether they can consistently generate revenue. By Mathew Schwartz

IT'S MAY 1995: You're using browser-based chat, available only at online community Theglobe.com, to chat with a friend in Australia. You submit a message to the public chat board, then hit reload about 20 seconds later to see if she's responded. Of all the posts made in that time, you see one near the top with a purple cartoon icon. It's her reply. You come back often. You become part of a valuable asset — an audience Theglobe.com and the few other dedicated community sites can sell to their advertisers.

Flash forward to the present: Instant messaging has made chatting by posting to a Web page obsolete. But that's not all that has changed. "Communities were defined by their technology and tool sets. An online community was a destination site where a user could find often-proprietary interactive technologies such as chat, forums and home-page building," says Christopher Auxier, who was director of new product development at New York-based Theglobe.com, until he left recently for a start-up he declined to name. Today, the technology is commoditized, ubiquitous and as mature as phones, whose sizes and designs change, but whose basic functions remain the same.

Community Money

As their technology became more widespread and their livelihood more tenuous, most stand-alone communities vanished. Tripod Inc. and Geocities, the two most successful, were bought in 1998 and 1999, respectively, by Lycos Inc. and Yahoo Inc.

Yet the potential of community may still enrich sites selling other things, by attracting and keeping an audience.

Communities alone don't always

equal their weight in revenue. A September Forrester Research Inc. study of 20 sites showed that their community areas accounted for 22% of traffic but only 7% of revenue.

Communities can make money, but they're difficult to monetize. "That's been the great quest of online community sites, and frankly, I don't think you can point to any site that's nailed it," says Oliver Sharp, chief technology officer at the youth-oriented community site iTurf.com, which was profitable in 1998 but not in 1999.

But there can be indirect benefits that are hard to ignore. For instance, iTurf.com attracts more teen-agers than any other online community. It's also the exclusive online presence of catalog retailer Delia's Inc., which sells teen-oriented fashions. Put them together, and you help account for \$1 million in revenue per week during last year's fourth quarter, 85% to 90% of which was derived from product sales.

Communities also improve the customer relationship. "When was the last time you talked to 5,000 of your customers?" asks Vanessa DiMauro, vice president, community at specialty foods

business-to-business company Project-Truffle.com in San Francisco.

Forget about commissioning expensive marketing research, says DiMauro; communities are "an opportunity to engage a real live focus group, in a trustful relationship." After establishing this relationship, a company can develop and sell additional products and services to its customers.

Keeping their trust is crucial and takes fastidious integration among technology, design and content. "Someone who's pretty technology-savvy has to be part of the process of designing the whole community, because the people who don't have that knowledge don't know what is or isn't possible," says Sharp.

How to Build a Community

Want to add community? There are four options: Use free services, such as Lycos and eCircles; have someone else host the service — which costs approximately \$1.50 for every 1,000 page views; build it yourself; or buy community products off the shelf.

"There are two factors for me behind choosing a community tool if you want to host it yourself," says Dan Shafer, chairman of WeTalk Network and the founder of two communities: Salon.com's Table Talk and CNet Networks Inc.'s Builder.com. "It has to be stress-tested," he says. "And it has to be completely extensible" so that developers can add features and functionality without having to wait for the vendor to provide it.

Shafer chose Web Crossing 4.0 from San Francisco-based Web Crossing Inc. (www.webcrossing.com), in part, because it has "fully extensible JavaScript on the server and contains its own object model," he says. Though it comes with discussion boards, chat, instant messaging and Web-based e-mail, Shafer's company has added to those capabilities and is adding personal home-page creation and clubs as well.

Sharp says he wanted users to be able to vote on the quality of postings then tally the points to reward the users who post the best content, while driving other members to that content. He also wanted software that could handle lots of traffic. So Sharp, who has a Ph.D. in computer science, wrote community software for iTurf that helps moderators highlight "ideal behavior." It handles 7 million page views per day, but Sharp says it can handle 25 million to 30 million per day.

No matter the software, some human has to work with two staffs: the technology group and the moderators. The moderators are hosts to the community — and students of it, living like anthropologists in a society they seek to understand. "Community is fragile and delicate and highly affected by small elements of the Web design. It's an organic thing that has to be grown and nurtured," Sharp says.

Nowhere is that statement more evident than in sites that try to just graft a community component onto another Web site.

"If you go to a site and it's not populated by users yet, it's just populated by fake editorial, as in, 'Here's the Place to Talk About Sex,' and there aren't any conversations, then it's horrible," says Heather McDonald, co-founder and head of community at gURL.com, which is part of the iTurf network.

The solution: Just listen to users, she says. "In the beginning, gURL.com didn't even have a community component. When we began the site, girls were harassing us: 'We want to chat! Give us online message boards!' But we thought online community was boring," says McDonald. But users craved those features and quickly began using them once they were added. "That's what we go back to — what we hear from the girls," she says.

Even a popular community needs someone to keep conversations on track. "There are two kinds of meaning-

ful discussions online: those that are obscure, and those that are moderated," says Sharp. Moderators keep monomaniacal participants from spinning threads off into tangents, establish a norm for behavior and make sure unruly users get warned or expelled.

At gURL.com, there are also specific rules. "We have agreements all over that the girls have to sign," says McDonald. "They have to treat each other with respect so that when we kick somebody out, it's not because they're bad but because the community isn't going to work if they're bad."

Rewards for Good Behavior

Rules are one thing, but rewarding good behavior helps reach the ultimate goal of any community site: "getting them to stay there, and having conversations they want to follow every day," says Shafer.

At WeTalk, users get incremental Talking Points for every consecutive day they log on to the site or for when they make a post their peers rate highly. Those points can be used in auctions with items that are of high value to the community but of low cost to the company. At a baseball team's site, it might be autographed baseballs. Businesses trying to encourage salespeople or others to log on to keep in touch with customers can also offer points employees can use in auctions for such perks as golf outings or extra days off.

Best of all, successful communities become largely self-sustaining. Shafer says Salon.com's Table Talk users often reprimanded unruly participants even before his quick-responding staff had a chance. And when he left Builder.com, CNet didn't even need to hire a replacement because he had already transferred host and moderator duties to eight volunteers.

"Leadership emerges naturally online as it does in communities in the real world," says Shafer. "They probably didn't miss me very much." ▀

Blueprint for Community Roles

Whom do you need to build a community? As with many business initiatives, communities are about more than just choice of technology. Having the right people is important because "companies need to start with the functions and goals they want their community to have, as opposed to a 'What do you do to build it?' perspective," says Project Truffle.com's Vanessa DiMauro. Thus, the staff can influence software choices and subsequent modifications. Unfortunately, she says, "there is also a shortage of community builders." Nevertheless, when launching a community, these are the roles she suggests a company fill:

VICE PRESIDENT OF COMMUNITY STRATEGIES

- Akin to a city planner.
- Mobilizes the community through its different phases of growth and partnership.

SYSTEMS ADMINISTRATORS

- Run community software and expand its functionality.

DESIGNER OF SPACE

- Creates a compelling community environment.

EDITORIAL

- Even a small staff can seed discussions with content and provocative posts, which can then lead to greater and greater amounts of user-generated content.

HOSTS/MODERATORS

- Motivate the troops.
- Read every post in its entirety to see if it's on topic or not (though some software can automate this process).
- After a community starts functioning, the job can often go to community leaders.

How Big Can a Community Get?

Today's communities can have dozens of sections, each with many active threads and scores of new posts every day. For all but the most extroverted users, breaking into those discussions can be daunting.

"It's like being at a party and everyone has already paired up," says Dan Shafer, chairman of the WeTalk Network and founder of two other online communities: Salon.com's Table Talk and CNet's Builder.com.

At Salon and CNet, Shafer says, once membership reached 50,000 people, community growth slowed. That was a constant, even though user demographics were very different: Table Talk users stayed online for long periods

to talk about culture, while Builder's overworked Web developer population came online looking for fast solutions to Web problems. At 50,000 members, says Shafer, the level of established relationships and sheer size of the community became barriers to entry.

In the past, communities such as Geocities and Tripod tried to stimulate new membership and overall participation by introducing new technologies, such as chat, home-page building and e-mail lists. When that didn't work, they added neighborhood and club metaphors to help users self-select into interest groups.

But Shafer doesn't think new technology will surmount psychological barriers to entry. So he's testing a technique he calls "ponding."

It involves creating separate starting points for new members to enter already established communities. These topic-specific front doors let new users get comfortable with one aspect of the community before tackling all of the others. "For people who are just coming in, it's a reduced interface, yet it's still part of the larger group, so group dynamics can play into the whole thing," says Shafer.

Shafer has to wait to test ponding until WeTalk's communities become sufficiently large. Just in case he's wrong, his company is hedging its bets by building communities for David Bowie, the New York Yankees and teen pop group Hanson.

— Mathew Schwartz

TALENT SCOUTS

They excel at spotting, luring and keeping key players. Their advice can help you get discovered as a superstar — or help you sign one up. By Dawne Shand

The war for talent pervades the role of the CIO, who now owns as much responsibility for his employees' career development as he does for information technology systems. We asked four top IT leaders how they find, develop and retain talent. What we learned will help you manage your career.

BILL GODFREY

CHIEF TECHNOLOGY OFFICER,
DOW JONES & CO., NEW YORK

■ How do you spot talent?

The competencies that characterize talent go beyond skills and technologies; they are personal traits. Like self-

confidence — can you make good decisions? Like analytical thinking — can you break down a problem, focus and solve it without getting mired in the trappings of rank and organizational charts? And interpersonal skills — are you thoughtful of the concerns of others?

Do you have a sound understanding of and genuine interest in the business? Are you willing to act like an owner? Can you rise above the pressure to conform? Can you advocate a point of view, and are you comfortable with conflict? Do you have passion?

People connect to vision and to other people.

In senior leaders, we look for an underlying belief that you can have an impact, that through personal industry you can change the status quo. Leadership isn't a formal title. It changes

within the context of the problem being solved.

■ How does a company develop these attributes?

Institutionalize the language of core competencies. It's not just [a human resources] tool; It's the basis for hiring, performance management, promotion and leadership development. To execute, there must be organizational commitment toward individual development and the HR resources to connect individuals to development plans. You need a leadership team that empowers people, that acknowledges mistakes will be made, not punished, that puts people in stretch situations.

■ What career advice would you give?

Think in terms of two- to three-year building blocks. Be in a job where you're acquiring new skills. Work for leaders who challenge your intellect and passion. Associate with good projects, volunteer for the big ones, those that require energy and overtime. Get mentors, two to three people who you respect. Sponsorship is a powerful career-management tool.

The breadth and depth of technology today means that you can't be all things. Don't dabble: You won't have the specialization needed to solve problems. Get really good at the skills required for your job or team or industry.

Today, you get ahead by acquiring skills that may look like horizontal movements. But if you keep adding to your résumé those skills and projects that lead to career growth, you will be sought after.

THOMAS WOTEKI

CIO, AMERICAN NATIONAL RED CROSS,
FALLS CHURCH, VA.

■ What attributes signal talent for you?

We tacitly assume that people have the technical skills they were hired for. Beyond that, we look for problem-solving skills, like a good understanding of risk management and an ability to explain problems and find solutions.

People need to be good listeners. As IT is a support organization, it's important that we pay attention to our customer needs. Questioning do we really know what problem we're trying to solve and why — that exhibits this skill. We look for people who can see beyond the immediate problem, connect with other things going on or see its similarity to other requests and understand its impact on organization.

■ What career paths develop talent?

As managers, we need to develop people as assets. That means managing personal relationships and building trust with our employees. We encourage people to come forward and say what it is that they want to do. We encourage people to look for opportunities. But we believe it's the employee's

Continued on page 54



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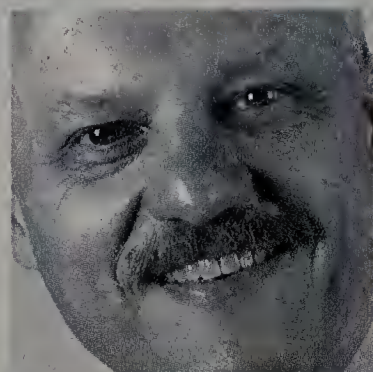
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**BRIAN LIGHT**

We look for confident and assertive people who can be proactive in identifying opportunities, who can work with ambiguity, have a strong desire to achieve and work well in teams.

**RON GRIFFIN**

Traits like openness, flexibility and an ability to change are important. We look for people who enjoy working in teams, enjoy making a difference and learning new skills.

Continued from page 52

responsibility to manage their career.

Management will offer to talented individuals opportunities that these people would find exciting and challenging and would stretch their abilities. When we put people in a stretch role, we pair them informally with a mentor who can guide them.

■ *Is talent demonstrated by a willingness to learn new things?*

Yes, it's about working on unfamiliar problems and renewing yourself.

People exceed their expectations. Eight months ago, an HR associate working with senior staff demonstrated that she was a bright, talented problem-solver with the potential to be a good manager, but she had no IT background. We brought her into a program-planning role; she is now actively managing engineering efforts. It's been a remarkable transformation.

■ *What's more valuable — technical mastery or knowledge of the business?* We're managers, but we're technical managers. People with an understanding of the business, with good problem-solving and analytical skills, are more valuable than pure technologists. I can partner the business person with someone with deep technology skills; however, the technology portion isn't gone, it's just in someone else's head.

BRIANLIGHT

CIO, STAPLES INC., FRAMINGHAM, MASS.

■ *How does Staples spot talent?*

Talent reflects the culture of the organization. Staples is a rapid-growth, fast-paced environment with an entre-

preneurial spirit. We look for confident and assertive people who can be proactive in identifying opportunities, who can work with ambiguity, have a strong desire to achieve and work well in teams.

The best people, the high performers, aren't necessarily the most technically astute. They tend to be the self-starters, the quick learners and the critical thinkers.

■ *What skills should people focus on developing?*

A few years ago, we were order-takers. We looked to the business to help us prioritize projects. We've transformed to bring more value to the table. Therefore, we need proactive people who understand the technology's use and can identify opportunities on the front end.

We encourage our people to develop expertise in business topics such as supply chain management, warehouse operations, store operations and to contribute business best practices. This way, they can talk knowledgeably about the business, and IT takes a more active role.

Becoming a technical expert demonstrates mastery. And that's important. But understanding the business objectives as well as the technology is a powerful combination.

On the tail end of systems usability, IT people need to be more familiar with change management as more people use these systems.

■ *How do you develop talent?*

We employ extensive behavioral interviewing. We don't use it to weed out people but to develop them moving

forward. These written reviews show how they perceive themselves and how others do. Given twice a year, the test is used to develop a training plan for each associate, which addresses at least one soft skill or leadership need. A large percentage of our training through Staples University goes toward professional development. There's not a shortage of technical skills, like networking or database administration. Our main need is to effectively work with the business side.

Specifically, we look for 12 behaviors. Senior people must possess certain fundamentals: They're strong achievers, able to lead change and can position others for success. Junior people must demonstrate confidence and be self-starters.

RON GRIFFIN

CIO, THE HOME DEPOT INC., ATLANTA

■ *What attributes signal talent?*

We look for fundamental intellectual horsepower. But intelligence without personality won't work in this culture. Traits like openness, flexibility and an ability to change are important. We look for people who enjoy working in teams, enjoy making a difference and learning new skills.

■ *How do you retain talent?*

It starts with finding the right people — those entrepreneurial and team-oriented people. Then we de-link their titles from their responsibilities.

I might have a senior systems engineer lead a team because he or she has a deep technical and functional expertise in an area important to the project.

But on the next project, that same person might be playing a Java programming trainee role. I don't change their job title or their salary level.

This de-coupling gives us the flexibility of assigning people to growth opportunities.

We really focus on continuous learning. Our model is grow, row and show. Grow means we want people to learn new capabilities. Row means you now use these new skills to get the boat moving. Show means you can teach these skills to someone else.

We want people to develop lots of skills. That's why we have these "broadband" career paths, where people can move up to more responsibility or across to gain new skills. A systems engineer may have more skills and can play more roles than a senior systems engineer and therefore makes more money. That range provides a lot of value to us.

■ *What career advice do you give out?*

I liken this advice to a three-legged stool: The first leg is the technology. Become well balanced in understanding the technology, the hard skills, the methodologies, the governance techniques. Second, know the business outcomes. You don't introduce technology for technology's sake. You use technology to get a sustained business outcome. Third, build relationships. Treat others as well as you'd like to be treated, build positive relationships, and you'll go a long way. ▀

Shand is a freelance writer in Somerville, Mass.



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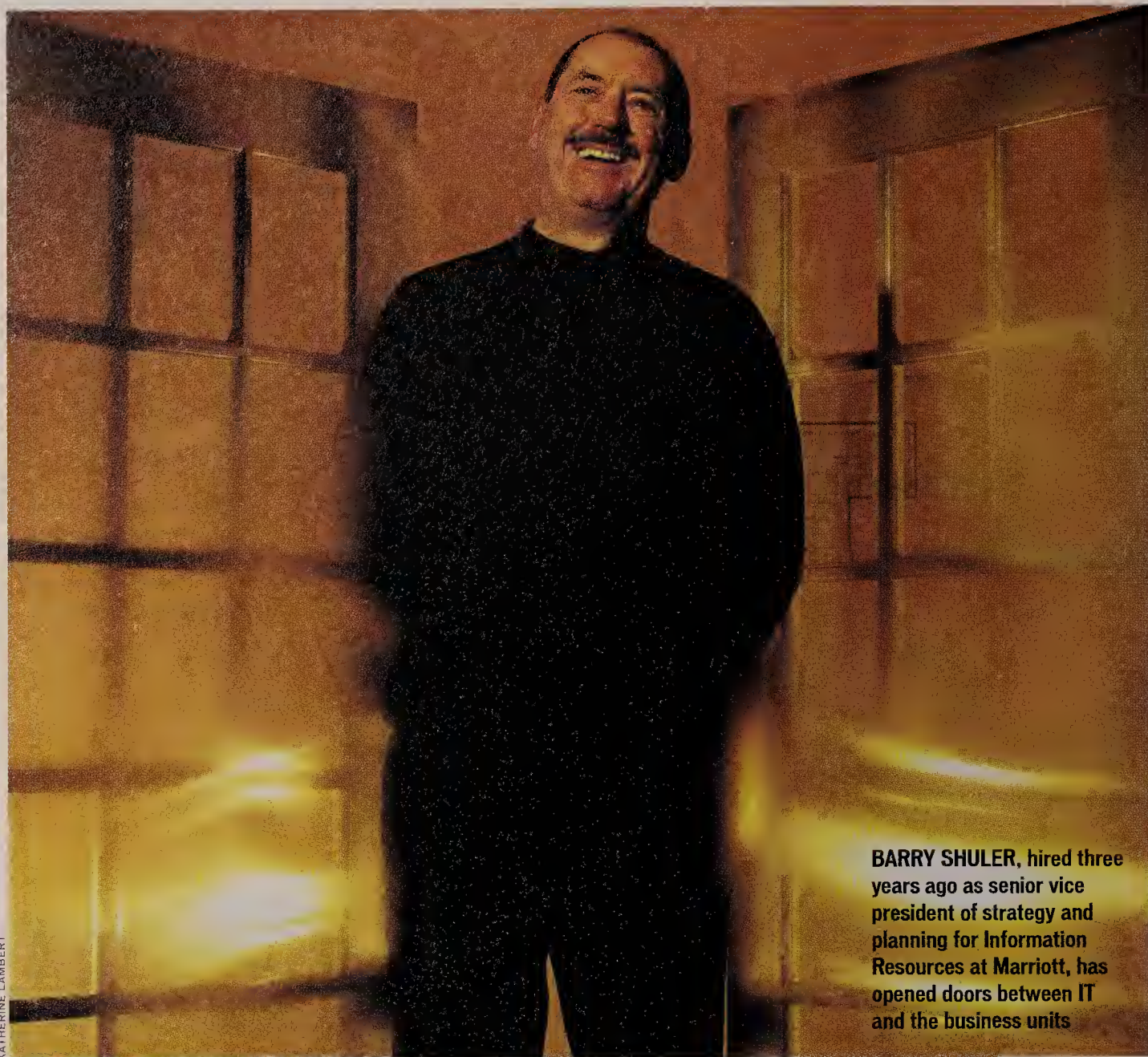
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KATHERINE LAMBERT

BARRY SHULER, hired three years ago as senior vice president of strategy and planning for Information Resources at Marriott, has opened doors between IT and the business units

Aligning Marriott

Want to see the benefits of IT and business alignment? Check out the Marriott hotel chain, which has spent three years bringing both sides together – with positive results. By Deborah Radcliff

It's 7:30 a.m., the finale of a two-day executive meeting at Marriott International Inc.'s conference center in Chantilly, Va. Carl Wilson is fielding questions from 20 of Marriott's top-volume business customers during the hotel chain's quarterly relationship-building meeting. Questions like "How could you make us more successful in our jobs as travel managers?" and "How could we work better with your supply-distribution pipeline?"

For Wilson, Marriott's executive vice president and CIO, it's just another day in the company's executive sandbox. "I attend meetings for a living," he says with a laugh. But his real reason for attending this retreat? "It's good to help shape the strategy to service our customers better."

Wilson's presence at these meetings is part of Marriott's three-year push to align its information technology group, called Information Resources (IR), with corporate strategy. And it's working so well that, because of improvements to its customer service applications, Marriott in February earned recognition from *Fortune* magazine as the "most admired company in the lodging industry."

Three years ago, Marriott's president and chief operating officer, William Shaw, recognized the need for more strategic IT-business alignment and acted. He hired a senior vice president of planning for Information Resources and invited the CIO into the boardroom.

Today, the business dictates every technology decision, and IR is part of

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Continued from page 58

the process. Thus, by erasing the lines between business and IT, Marriott has embraced what analysts say will be the key to maintaining a competitive edge in the 21st century.

"If I don't have a strategic relationship with my business partners to identify problems and opportunities to leverage information technology, then I'm bleeding critical lifeblood out of the company," says Jerry Luftman, executive director for the graduate information systems programs at Stevens Institute of Technology in Hoboken, N.J.

If your IT organization isn't represented in the boardroom like it is at Marriott, it's probably because you're not walking the business walk and talking the business talk of value, revenue and process. But by following basic stepping-stones — getting to know your business, communicating a business message and participating in planning meetings — you can bridge that gap.

STEP 1: Communicate

It starts with communication, but not the type of techno-dialogue that makes an executive's eyes glaze over. Instead, IT executives need to look at the enablers and inhibitors of each IT project. Then, they need to better market their ideas in language that business executives are comfortable with, explains Luftman.

Wilson calls this "taking the mystique out of IT delivery." Corporate executives know their business, which traditionally hasn't been technology. But now business applications, network infrastructures and the Internet are as strategic to their business as a good marketing plan. Corporate leadership is recognizing this, but executives have to get up to technical snuff.

Barry Shuler, Marriott's senior vice president of strategy and planning for IR, has helped to technically season Marriott's executives by speaking in analogies and "what if" scenarios and using profit-and-loss charts. For example, because Marriott is on an aggressive acquisition track, it needed a flexible network infrastructure and applications to quickly link new properties. Here's how Shuler, a former race car driver, sold the new network:

"Bill Marriott Jr. [CEO and chairman of the board] owns several exotic cars. He loves talking about cars. I tell him the infrastructure — the hardware and system software connecting the network — [is] like the road," Shuler explains. "Then I ask him, 'Why would you want a thousand roads coming to the same place, when you can have one?' I compare our applications to trucks and cars driving on the road. And our Information Resources people are the pit crew."

But it's tough breaking into the boardroom for the first time. To do

AT A GLANCE

Marriott International Inc.

Revenue (1999): \$8.7 billion

Headquarters: Bethesda, Md.

Total assets (1999): \$7.3 billion

Employees: 143,000 (approx.)

Businesses: Lodging (81% of last year's sales), senior living services and distribution services

so, IT executives must often find an ally on the business executive team, advises Luftman.

In Marriott's case, that champion was Shaw, who hired Shuler three years ago to align IT with the business.

"Our customers are increasingly integrating technology into their lives, and it is becoming part of their entire experience with Marriott International — from travel planning on the Internet to high-speed Internet access in their guest rooms," says Shaw. "This makes it critical for Marriott to align its IT strategy with its business strategy."

STEP 2: Build a Plan

You also need a plan. To do this, Marriott formed teams of business and IT managers to benchmark existing processes. Then the teams built a "quick-hit" and long-term plan, including resource requirements.

During its benchmarking stage, Marriott found a number of inefficient processes. For example, it hadn't streamlined its value chain. Each hotel bought all of its soaps, shampoos, towels and other consumable goods from its favorite vendors. Because of disparate systems, Marriott was losing out on volume discounts, products went to waste and accountability was spotty. Marriott also realized it lacked a way to track and improve revenue per customer, among other things.

Once the baseline was complete, Marriott's IR strategy and planning teams developed a strategic time line and architectural plan. To accommodate the rapid transformation and creation of so many needed applications, Marriott first required a more flexible network, which it targeted for its quick-hit list. It also determined that the most efficient way to build out the new applications was with reusable object-based applications that would also change quickly with the business.

"Rather than just go out and get the latest bells and whistles, we decided to invest in techniques and infrastructure today that will allow it to be quick tomorrow," Shuler says. "We are building our application portfolio to serve any user interface that comes down the

pike. Today, it's the Web. Tomorrow, a handheld or cell phone."

Marriott now has the new network infrastructure in place, with properties tying into the same procurement and customer relationship management systems.

STEP 3: Life-Cycle Governance

Ambitious rollouts like these also spotlight another huge disconnect between IT and business: accountability for project delivery. "Even with some semblance of governance, typically there's no process for performance review and accountability once a project is approved," contends Ryan Schmelz, managing partner at Transition Partners, an IT management consulting firm in Reston, Va.

When projects start out with an executive management team, they often fall off the radar, mostly because of changes in the business or executive management turnover, Schmelz adds. This, he says, results in projects that are often funded long after their usefulness or that are left incomplete.

IT projects must be held to the same level of accountability as any business initiative. Schmelz advocates an "accountability ladder" similar to Marriott's model: an executive sponsor at the senior vice president level or higher, and project owners from the business side (generally a department manager) and from IT (a manager). The IT owner also has a direct pipeline to the CIO to bilaterally discuss projects with executive peers.

At Marriott, accountability is shared between business and technology project leads. Each project starts with an executive sponsor, who chairs a steering committee headed by a business project manager, "joined at the hip with an Information Resources project manager," Shuler explains.

Because of this level of inclusion, the technological aspects of new initiatives are fleshed out concurrently with the development of new projects. This cultivates a more efficient flow of ideas and business development.

"As a business partner, Marriott IT executives participate in all business strategy review meetings," Shaw says. "When Marriott holds a major budget review, we always discuss IT, just as

we would discuss finance or human resources. On all major projects, all my direct reports, including Carl Wilson, share major business objectives."

With such accountability, Marriott is now measuring the benefits of IT projects and preparing a system to measure the performance of those applications throughout their life cycles. The company has done a decent job in the past with cost control and project management, but it has had problems quantifying a project's actual benefits. Under the alignment initiative, Marriott is building a proprietary automated system to measure life-cycle performance of projects. Shuler adds, "We need to monitor these programs continually to see if... we deliver what we say. This is responsible business."

STEP 4: Looking Forward

As benchmarking efforts move ahead, so too do forward-looking initiatives like customer relationship management projects that stretch Marriott's sales force automation tool into a platform for a number of interesting applications, such as prestay sales of golf or spa packages. In the future, guests will even be able to book extra services like these or tweak their itineraries online.

Most of these initiatives are launched by business departments, executive teams and even sales representatives who are excited about the benefits IT can bring to the business. But all this new development has stretched Marriott's IT resources. It has increased the number of people working on IT projects by one-third and boosted IT spending from 5% to 15% per year since 1996. No longer does IR struggle with ill-defined technology projects or dictate the software development and support for business applications. And there is no longer any distinction between an IT project and a business initiative.

"IT at Marriott is a key component of the products and services that we provide to our customers and guests at our properties," Wilson explains. "As such, there's very little that goes on within the company that either I personally or one of my direct reports is not involved in." ▀

Radcliff is a freelance writer in Northern California. Contact her at DeRad@aol.com.

Owning the Business

"How can IT managers deliver something that is going to change the business when they don't own the business?" asks Jerry Luftman, executive director for the graduate information systems programs at the Stevens Institute of Technology (www.stevens-tech.edu).

If this sounds familiar, follow Luftman's advice:

1. Build a team of IT and business people.

2. Ally yourself with a business executive to champion and sell ideas.

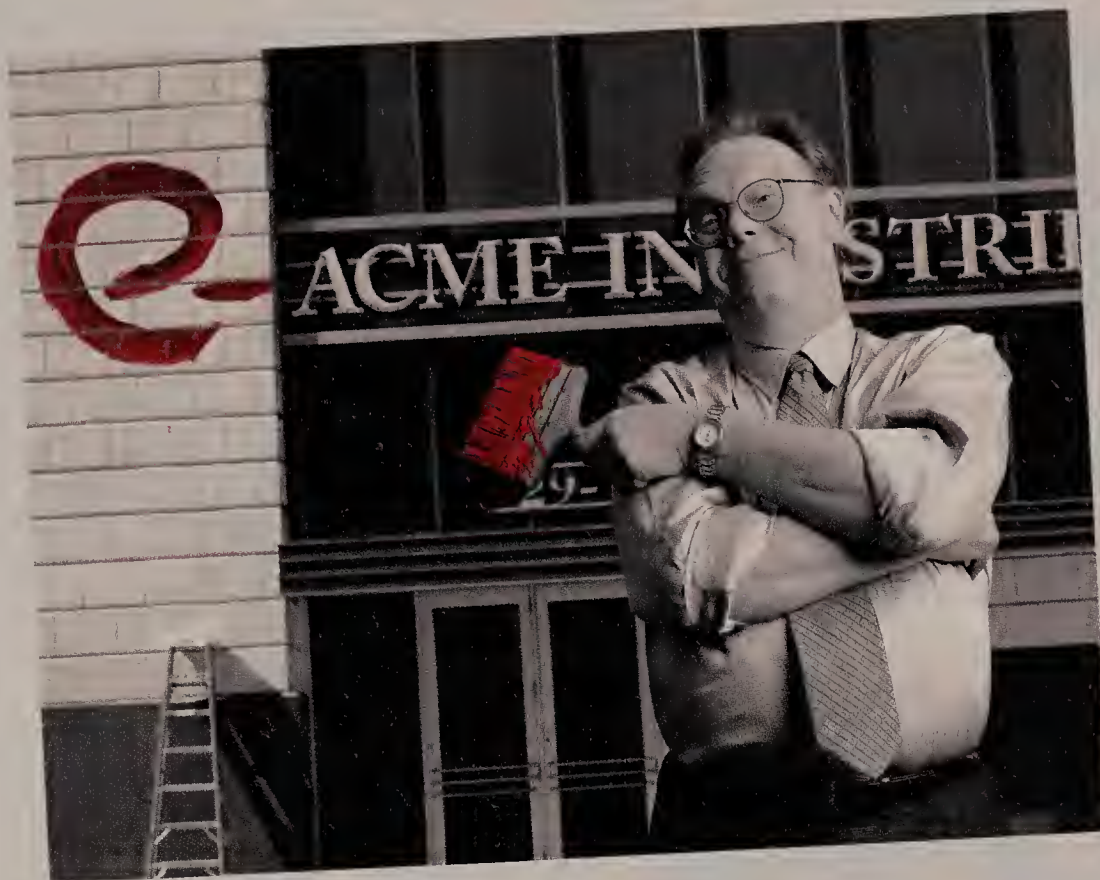
3. Clearly understand the complexities of business.

4. In business language, help business understand IT's complexities.

5. Establish similar rewards and motivations. For example, don't measure IT on costs while measuring business on profits.

6. Manage and monitor all business-IT projects through the life cycles of the applications.

— Deborah Radcliff



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Teaming Up for the Web

THE WEB HAS CHANGED the nature of how organizations' information technology and business sides work together. Gone are the days when just one side called the shots. To ensure a successful site, the two must be equal partners.

On the Internet, IT "isn't just a support function," says Keith Fox, vice president of new media at The Reader's Digest Association Inc. in Pleasantville, N.Y. "It's much more of a collaboration, and IT is an owner" in both the process and the result, he says.

Upscale clothing merchant Lands' End Inc., which conducts about 10% of its business on the Web, recently launched a personal-shopping feature on its site. Thanks to tight linkage between IT and the business side, the service — called Lands' End Live — has been a huge success and yields "several hundred" customer queries each day, says Linda Severson, director of business systems at the Dodgeville, Wis.-based firm.

IT was involved in that project "every step of the way" and managed it from both the business and technology sides, Severson says. The idea for the project originated in a weekly brainstorming meeting attended by staffers from every part of the company.

Lands' End isn't alone. In fact, this type of partnership is more critical than ever in the Web world, observers say.

"The Web has much more of an impact on the business" than did previous applications that didn't touch customers directly, says Chris Selland, vice president of e-commerce strategies at The Yankee Group in Boston. "It's one thing to screw up my payroll application, and it's another thing entirely to screw up the Web site where everyone can see it." So, he says, "the line-of-business folks have gotten much more interested in IT."



LINDA SEVERSON says a tight linkage between IT and business spelled success for Lands' End

Yet IT professionals and those in the business units can still have "very different" perspectives, Selland says. It's essential to cross the gap if a company is to succeed on the Web. It can be done, but it takes active participation from both sides (see story at right). The best partnerships happen when technical staffers understand the business and business users have a passion for technology.

For example, when it came to hiring employees for Aetna Inc.'s e.Health initiative, the insurance giant seeded its teams by splitting IT and business employees among them, says Malcolm Welch, the company's chief technology officer. Aetna used in-house people when it started its e-commerce teams. It sought out techies with business savvy and looked for business users who "by background or personal tendencies" understood technology, Welch says. The Hartford, Conn.-based company has since supplemented its staff

with technologists who are in an MBA-style program.

"We need people who are a cross between technology-literate and business-literate," Welch says. "It's been a transition for us."

DEFINING THE APPLICATION

The big difference between the Internet and previous technologies is that now both IT and business define an application, observers agree. In the past, businesspeople defined problems, and IT built the specifications. Now, it's more of a back-and-forth process, where business defines a problem and IT then describes how it could happen online; that way, the scope of a project can change even as it's being built.

"The business realizes if we can do that, then I really want to do something totally different," Welch says. "It's much more push-pull vs. before."

Another factor is the "need to play outside the walls of your own enterprise," says Fulton Wilcox, director of technology business development at BOC Gases Inc. in Murray Hill, N.J. "You have to understand all these issues about your customers and suppliers, as well as about yourself."

Indeed, observers agree that the essential ingredient for IT staffers to be viewed as effective e-commerce partners is a willingness to learn business issues and the ability to see the big picture. The good news, Wilcox says, is that "the abilities of internal IT people to adapt to this world are underestimated" in most companies.

"The fundamental skills that IT people bring to this new world are very useful, if they can get training [in both business and technology issues] and understand the broader horizons," he says. After all, as Wilcox says, "nobody can do this alone." ■

Ambrosio is a freelance writer in Marlboro, Mass. Contact her at JohannaAmbrosio@aol.com.

We Can Work it Out

Some tips on how to make a business/IT e-commerce partnership effective:

- **Don't focus on just the technical skills needed for the Web.** Ensure that IT staffers understand the big picture of the company's business.
- **Attend business-side strategy and planning meetings, and send your people, too.**
- **From the IT side, make sure there are clear project leaders in different technical areas.**
- **Make sure that the teams of business and IT people working together are truly empowered to change processes, resolve conflicts and do whatever it takes to succeed with the project.**
- **Stay on a common track by focusing on what the customer wants and needs to get out of the project.** What will the customer be able to do differently or do for the first time, and what will his experience be like?

Successful e-commerce depends on a strong partnership between IT and business. Here's how it's being done.

By Johanna Ambrosio



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Digital Signatures

DEFINITION

Digital signatures are special encrypted codes attached to an electronic message. The codes let the recipient know that the person sending the message really is who he claims to be. They are one of the promising ways of ensuring authenticity and establishing trust within e-commerce marketplaces. But there's still a lot of disagreement about what forms of encryption work best and how to set up digital signature networks.

BY DEBORAH RADCLIFF

WEBSTER'S defines a signature as "the name of a person written with his own hand."

OK. But how can you be sure a signature in cyberspace is the real thing?

The challenge in e-commerce is to eliminate the risk of false identity, says Paul Donfried, a vice president at Identrus LLC in New York. Identrus was formed by 12 of the world's largest banks to provide a global framework for trusted business-to-business commerce.

Right now, digital signatures hold the most promise of helping electronic businesses sort through the complex issues of identity risk and liability in cyberspace.

A digital signature binds a person's identity into an asymmetrically encrypted private key. This private key is issued to only one bearer and is used to digitally sign and encrypt a communication. The message can then be opened by someone with a public key.

Digital signature systems are all established within a public-key infrastructure (PKI), which is maintained by a certificate authority. The certificate authority is responsible for assigning keys and ensuring the validity of certificates.

The ground rules for each digital signature network must be carefully spelled out. For in-

stance, what type of encryption method will be used? And who will serve as the certificate authority?

Already, 50 states have enacted legislation to define electronic signatures, each state with different terms, definitions and amendments (for a full list, visit www.mbc.com/ecommerce/legis/table01.html). And that's not to mention recently passed federal legislation and international laws.

Businesses can try to interpret this confusing mishmash of legislation. Or they can bind the digital signature with a prenegotiated contract that sets the terms and conditions of liability and recourse for any form of electronic transaction.

Old World Contracts

Ironically, the most trusted system for spelling out the terms of a digital signature network are traditional paper agreements that are physically signed by all parties.

"If the member stays within the framework of the contract, the actions will give legal force and effect," says Ted Barassi, co-founder of Phlair Inc., a business-to-business consumer application company in New York. Phlair helped develop digital signature guidelines for the American Bar Association in 1995.

"It's a clean, clear-cut way of promulgating those requirements without resorting to wholesale changes to domestic

law relating to the use of digital signatures as legally binding signatures," Barassi says.

Lately, certain vertical industries — mainly banking, automotive and medical — have begun rolling out PKI trading networks that bind their digital signatures around paper contracts.

For example, in the Identrus pilot, two or more parties on each end of the transaction enter into legally binding contracts to use the digital signatures within the specified framework. Under those conditions, the banks themselves act as the certificate authority, manage the risk and accept liability, much like Visa International Inc. or MasterCard International Inc. assumes liability for lost or stolen credit cards

among their member networks.

In the case of business-to-consumer transactions, there are no such contractual guarantees...yet.

In fact, online consumers have no way to contractually relinquish obligation on the part of a company the way that they can with Visa, MasterCard or American Express Co., says Ann Friedman Simmons, vice chairwoman of the Internet Council. The Council is sponsored by the National Association of Clearing Houses in Washington.

Rob Stuhlmuller, product manager at ActivCard Europe SA in Paris, says it's only a matter of time before credit-card-issuing banks will assume liability for online transactions.

"Banks, who right now are already the trusted entity, are well-poised to become third-party trusts and PKIs," Stuhlmuller says. "When that happens, you'll see this triangle effect, where three people are involved in online transactions — the bank, you and the online merchant."

Interoperability Difficulties

Visa and others have been testing such technology since 1995. But interoperability problems are holding up any global, contract-based business-to-consumer models.

While most PKI vendors

The Real Deal

Digital signatures accomplish four things, says Paul Raines, vice president of electronic security at the Federal Reserve Bank of New York:

- 1 Data Integrity** — The recipient can tell if the data's been tampered with.
- 2 Confidentiality** (encryption)
- 3 Nonrepudiation** — You can't deny receiving the message, because the public key returns a proof of receipt.
- 4 Authentication** for both sender and receiver

claim high standards of interoperability (x.509) analysts say it's still very difficult to certify digital signature bearers in a PKI when there's a mix of vendor products and certificate authorities involved.

"This is one of the big issues we're dealing with. Unless all parties in our external trading network use the same certificate authority, you have to worry about cross-certification," says John McGraw, security analyst at a professional services firm in Texas.

This lack of consumer contractual protections is indirectly costing merchants and buyers the most important intangible commodity in cyberspace: trust.

"There has been no case law challenging whether a digital signature is legally binding," says Larry Zanger, chairman of McBride Baker & Coles, a Chicago-based IT and e-commerce law firm. "Everybody's fear is that some piece of the puzzle would lead some party in the deal to get stuck with a transaction that doesn't have money on the other side." ▀

Radcliff is a contributing writer in Northern California. She can be reached at DeRad@aol.com.

Signing Off in Cyberspace

To legally bind a digital signature, you must draw up a contract that defines and legally assigns the roles and responsibilities of the participants. Don't try this without the assistance of your legal counsel, says Paul Donfried, a vice president at Identrus LLC, a business-to-business e-commerce infrastructure formed by 12 of the world's largest banks. The basics should address:

- Who's liable if the deal goes awry?
- What's the certificate authority's liability if the keys are misused or tampered with?
- What's the end user's liability for protecting the key?
- What's the system itself liable for if it damages or exposes the key?
- How will the contract be enforced?
- How will disputes be resolved?

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Dear Career Adviser:

I've been a technical writer for a long time, working at a large financial institution with mainframe and client/server technology and systems. Now I long to work at a newer company with Web-based projects, but I'm concerned that my skills need a major upgrade. What do

I need to do? Will someone hire me without experience?

— WRITING WENDY

Dear Wendy:

Three essential problems define your dilemma, says recruiter Sherry Epleyp at Advances Unlimited in Larkspur, Calif. The first is that while you know financial systems, you don't know how to express this information via the new medium of the Web.

Second, your technical skills do require an upgrade.

Third, if you target start-ups, you'll be competing against new graduates, some of whom read code and have computer science degrees.

Don't interview until you have a basic knowledge of technologies such as TCP/IP, HTTP and the Internet programming language HTML. You'll also want some hands-on expertise in graphics and Web-development software like Photoshop, PageMaker,

FrameMaker and Acrobat PDF from Adobe Systems Inc., RoboHelp from eHelp Corp. (formerly Blue Sky Software Corp.), CorelDraw from Corel Corp., PowerPoint from Microsoft Corp. and DreamWeaver from Macromedia Inc.

To find resources to update your skills, visit the home page for the Society for Technical Communications (STC) at www.stc-va.org and read *Intercom*, the STC magazine. Then, start building a Web site and developing Web documentation, even if you must offer free services to a friend.

Last, don't get stuck on maintaining your salary. Getting into this arena will be well worth it a year from now.

Dear Career Adviser:

I'm a technical consultant making excellent money as an Oracle database administrator. Some of the younger companies I'm working for seem

promising. Is there a way for me to participate in the stock program of a pre-initial public offering company as a consultant. What should I ask for?

— OPTIONS FOR OTTO

Dear Otto:

Only you can determine if the company has a promising future and whether taking any of your fee in stock is wise. If so, then you and the company will establish how you earn the right to these shares. Will you get them as options or an outright grant?

According to attorney Patricia G. Copeland, a partner at Brobeck, Phleger & Harrison LLP in Palo Alto, Calif., "consultants can sometimes receive options and share grants in lieu of cash, particularly if the consultant wants the potential stock upside and the company desires to reward the consultant for services rendered."

Given your consultant sta-

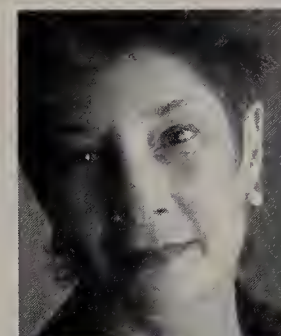
tus, a company can decide to grant you shares, create an option schedule whereby shares are granted during the term of your services or reward you with shares outright because of superior performance on a project.

Just remember that if you're granted an option for shares, you'll need to know how long you have to exercise it. Must you exercise the option when you finish the project, or does the term extend longer? Be sure to consult a tax attorney regarding applicable Internal Revenue Service code, including the "83B election" provision for how Uncle Sam participates in your potential windfall.

Dear Career Adviser:

I've been working as a LAN administrator for a state government. I'm working toward my Microsoft Certified Systems Engineer certification. I have also worked with server upgrades, T1 installations, setting up new user accounts, monitoring the network, installing server patches and antivirus updates, doing PC support and troubleshooting. We have a 60-user, Windows 98 network using Novell Net-

Ware 5, Microsoft Office 2000 and various Oracle database programs. What skills do I need to add to grow my career and expand my possibilities, especially in some of the hotter industries outside government? — OUTTA STATE



FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

Dear State:

According to a Cisco Systems Inc. insider, Web editors might be heroes, and developers might be demigods, but the true gods of the industry are systems administrators and webmasters. In short, your compensation would expand dramati-

cally if you take your LAN administration background and work toward a Unix systems administrator-level career.

A good way to explore this possibility is to visit the Cisco jobs site at www.cisco.com/pcgi-bin/jobs.pl to see what Cisco — and by default the industry — wants.

You'll see that your chances improve by getting the requisite credentials. Also, try to expand your work experience into diverse PC/Windows NT and Unix environments involving SunOS, Sun Solaris, HP/UX and perhaps even Linux. You can find Cisco classes at www.cisco.com/warp/public/10/wwtraining. ▀

BRIEFS

Gauging Performance

InfoRay Inc. announced the U.S. release of software that allows executives and other end users to do real-time monitoring of their businesses' performance. InfoRay was founded in the Netherlands but moved its headquarters to Cambridge, Mass. Its InfoRay 4.0 software gives users a Web-based view into corporate systems and databases. Pricing starts at \$100,000 for 25 users.

Commercial E-Mail

Cable & Wireless PLC (C&W) in London launched a new service last week that broadcasts messages on the Internet for online businesses.

SureCom Email Broadcast service, released at Internet World in Los Angeles, helps marketing companies and customer relationship management (CRM) businesses contact customers by e-mail. Pricing depends on volume and ranges up to 10 cents per message, said a C&W spokeswoman.

Schneider Buys Payment Service

Schneider Logistics Inc., a subsidiary of Schneider National Inc. in Green Bay, Wis., recently acquired the freight-payment services of Tranzact Technologies Inc. in Elmhurst, Ill. Tranzact processes more

than \$4 billion annually. The new company will be named Tranzact Payment Services. Terms weren't disclosed. With the purchase, Schneider becomes the first in the logistics industry to create a stand-alone business unit allowing customers to buy freight payment and audit as a separate service, the company said.

Oracle Ships Upgrades

Oracle Corp. met a late March deadline for shipping an upgrade of its enterprise resource planning applications that was originally due last fall. Oracle officials said the company also remains on track to ship a new order management module and an upgrade of its CRM software next month. The CRM package is about six months behind the original release schedule.

Demantra Debuts

Eventus Logistics last week changed its name to Demantra Inc. The Cambridge, Mass.-based demand-management software vendor will launch products next month, including support for collaborative planning, forecasting and replenishment, as well as sales and operations planning for online businesses.

Nokia Invests in GSM

Nokia Corp. in Irving, Texas, last week signed a multiyear agreement worth more than \$500 million with VoiceStream Wireless Corp. to bring Wireless Access Protocol-based mobile Internet services to U.S.-based customers. Nokia will provide wireless handsets as well as switching and radio networks.

Bellevue, Wash.-based VoiceStream is the largest Global System for Mobile Communications (GSM) provider in the U.S. GSM is the most widely used digital mobile technology worldwide.

MTI Signs Up Belden

MTI Technology Corp. in Anaheim, Calif., said it signed up Belden Communications Division, a subsidiary of Belden Inc. in St. Louis. The division will use MTI's Vivant Fibre Channel storage-area network and network-attached storage systems for its application environment. Phoenix-based Belden Communications provides products to support outside plant, customer premises- and broadband networks. Belden Inc. designs wire and cable products for electronic, electrical and telecommunications markets.

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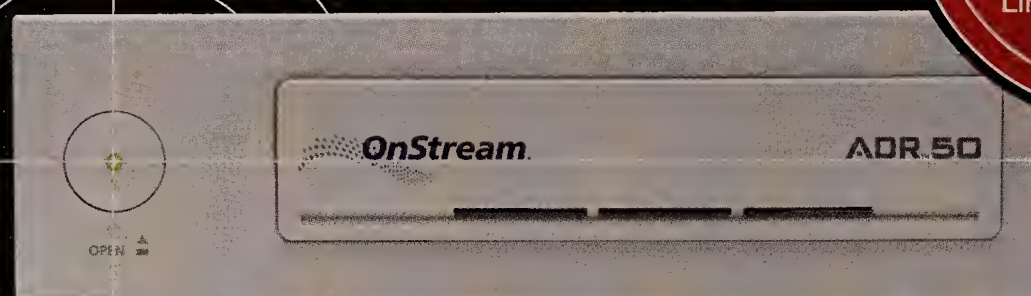
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CUSTOMIZED E-COMMERCE

For manufacturers, the real value-add of business-to-business digital marketplaces will arrive only when such exchanges can also support transactions that involve custom-engineered goods and multiple suppliers. Two software vendors claim to have software that will make all that possible. ▶ 73

WIRELESS LANs AT WORK

Only six months ago, wireless LANs were too slow. Now, speeds are equal to wired Ethernet. That's one reason a hospital group in New Jersey was able to use them to speed up and increase payments from insurers. ▶ 74

HACK OF THE MONTH

Denial-of-service attacks have been getting a lot of attention lately. But in the meantime, you need to protect your systems from credit-card theft. Contributing writer Deborah Radcliff reports on some tough lessons learned. ▶ 75

SECURITY JOURNAL

In Week 5 of the Security Manager's Journal, Pat escapes serious damage as his company is hit by its first e-mail virus. Then it's off to a security class, where a fellow student with a disk drive full of goodies

is more help than the teacher. ▶ 76

HANDS ON

How much notebook computer can you buy for \$1,500 or less... and is it worth the trade-offs in screen quality and weight? Reviews editor Russell Kay weighs in on the topic. He also alerts readers to a clever helper for Excel that distributes spreadsheet pages and consolidates them with the click of a mouse. ▶ 81

QUICKSTUDY

See our tutorial on Directory Services Markup Language, which holds the promise of advancing business-to-business e-commerce by simplifying compatibility with other companies' applications. ▶ 82

THINK GLOBALLY, COPE LOCALLY

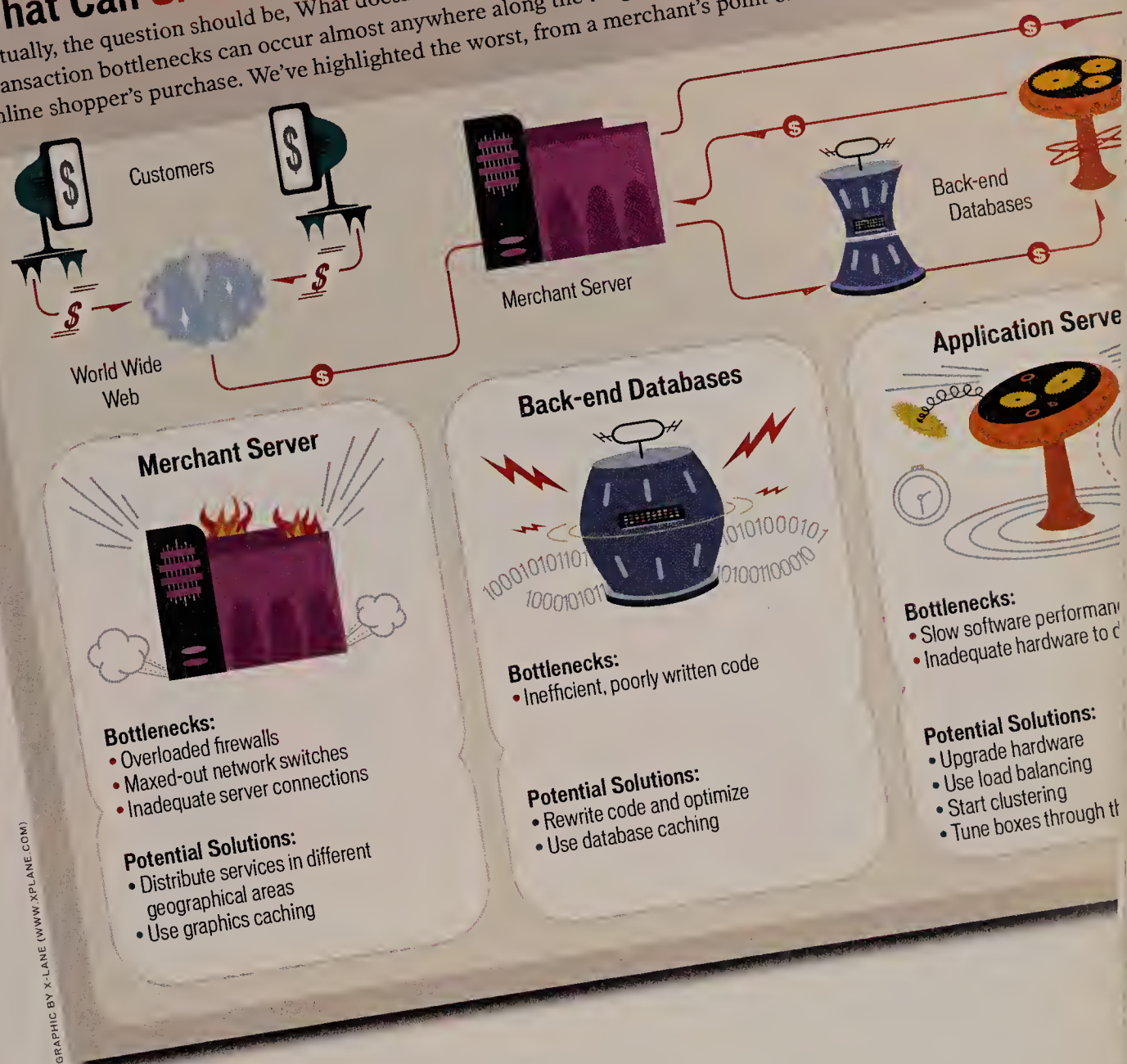
As companies implement global IT systems, their managers are finding out that they must still deal with regional differences in everything from e-commerce standards to enterprise resource planning applications. ▶ 88

EMERGING COMPANIES

Start-up MS2 Inc. builds Web-based project-collaboration tools designed especially for development groups. The tools are aimed at speeding up the development process to get products to market more quickly. ▶ 90

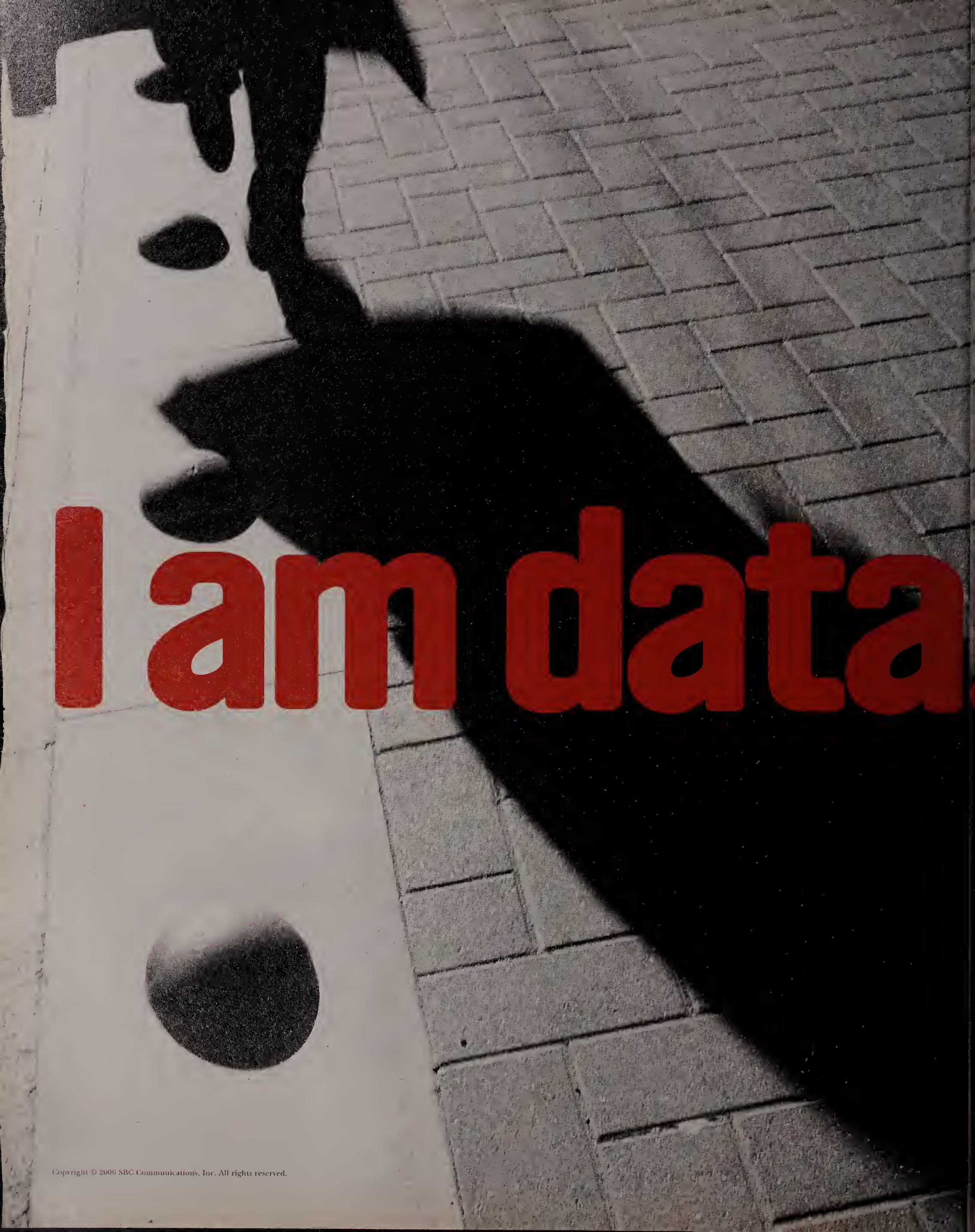
What Can Slow Down E-Commerce Site Performance?

Actually, the question should be, What doesn't slow down a commerce Web site? The answer to that question is much more complex. Transaction bottlenecks can occur almost anywhere along the long and sometimes complex chain of operations that an online shopper's purchase. We've highlighted the worst, from a merchant's point of view, along with ways they could



CLEARING WEB BOTTLENECKS

FROM OVERLOADED FIREWALLS to slow network connections, e-commerce site bottlenecks are so numerous — and sometimes so massive — that it's a wonder customer orders ever get through. And slow performance isn't really an option in the lightning-fast competitive environment of the Web. Computerworld looks at ways you can prevent some of the most common performance problems that plague commerce sites.



I

am data

I am data.

I am the common, everyday vocabulary of commerce.

I am the language

that articulated

the car you're driving,

shirt you're wearing,

book you're reading,

film you're watching,

product you're selling,

paycheck you're earning,

and swordfish you'll have

at that restaurant tomorrow.

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Vendors Offer Tools to Sell Customized Parts

Two companies pitching software that can help businesses buy and sell complex products online

BY JAIKUMAR VIJAYAN

BUSINESS-TO-BUSINESS digital marketplaces promise to be a great avenue for buying and selling commodity items. But few give manufacturers a way to negotiate on or buy and sell products that need to be custom-engineered or that involve multiple supply-chain partners.

Now, start-up TradeAccess Inc. in Cambridge, Mass., claims that it can help, with new software that it is pitching to digital marketplaces and corporations with existing supplier extranets.

TradeAccess claims that its software will help online exchanges offer services that let buyers and sellers of manufactured goods negotiate on factors other than price.

For instance, buyers looking for suppliers to produce a custom-engineered product would be able to post their entire bill of materials — including engineering blueprints — on such exchanges, draw up master purchase agreements and negotiate delivery and payment terms. They would be

able to consider bids based on several factors, such as the ability of the supplier to build to the right specifications, the ability to deliver to a rigid schedule or the suppliers' support and service offerings.

Capabilities such as these are crucial at a time when most business-to-business e-commerce marketplaces are focused mainly on auction and shopping-cart purchase models, said Tim Manahan, an analyst at Aberdeen Group Inc. in Boston.

Such exchanges are aimed only at delivering commodity products to buyers at the lowest possible prices. However, many businesses need

capabilities that often go "beyond dynamic pricing to include factors such as quality and delivery" when making a purchase decision, Manahan said.

Negotiating Needed

"We feel strongly that a real-time structured negotiation [capability] is of utmost importance" in helping companies conduct business-to-business transactions over digital exchanges, said Robert Kramich, a vice president at NECX Inc., an electronics components exchange in Peabody, Mass., that uses TradeAccess technology.

This is especially true in certain industries such as metals, where the sheer range of business-to-business purchase options and needs makes it necessary for digital exchanges to support negotiations between buyers and sellers, said Tom Balderston, a vice president at SGI Capital LLC, a venture firm in Radnor, Pa., that owns an online metals exchange.

Among the claimed capabilities supported by TradeAccess' ComRM technology are the following:

- The ability for buyers and sellers to define and set up business rules.
- The ability to specify both domestic and international commercial rules, like how currency payments can be made.
- A way to maintain an audit trail relating to all transactions between buyers and sellers.

- The ability to do real-time pricing, availability and tracking of orders.

- Payment processing, transaction reporting and delivering scheduling capabilities.

Comergent Technologies Inc. in Belmont, Calif., is another company that is trying to use the concept of Web-based business-to-business exchanges to help manufacturers cut costs for customers while at the same time allowing them to differentiate on issues other than price.

Comergent claims that its Distributed E-Business System suite allows manufacturers to build Web-based marketplaces linking their suppliers, resellers and distributors. Buyers visiting such sites will be able to custom-configure products from a variety of

options and choose from a list of bidding partners on issues relating to integration, delivery schedules, service and support.

Unlike typical digital marketplaces that are focused on delivering the widest array of products at the lowest possible prices, such partner exchanges will allow manufactures a way to reduce costs while giving buyers a way to negotiate services and other value-added costs, said Jean Kovacs, CEO of Comergent.

"Companies that are selling complex products don't want to just toss their products into a mass [digital] market" and be forced to compete on prices alone, Kovacs said.

"We are focusing on the 'sell' side... trying to give companies some control over their branding, how their products are ordered and what services are bundled with it," Kovacs said.

Pricing for the TradeAccess software will be announced when the products are released next month. Pricing for the Comergent suite, now available, varies according to the size of the installation, a company official said. ■



JEAN KOVACS, CEO of Comergent Technologies: "We are focusing on the 'sell' side"

SNAPSHOT

IP Service Growth

During the next four years, IP service revenue is expected to grow to more than \$70B because of the following trends:

- Faster application development
- Open environment that helps launch services
- Model that allows users to customize services
- Voice over IP and virtual private networks that will deliver applications

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Wireless LANs Speed Hospital Insurance Payments

BY JAMES COPE

The South Jersey Medical System is using wireless LANs to clean up insurance paperwork, logging six-figure sav-

ings thanks to payments from insurers that are both speedier and larger.

The Bridgeton, N.J.-based holding company, which operates four hospitals

in New Jersey, was in some instances not being paid in full or at all because of discrepancies in treatment codes entered by hospital officials. Each code refers to a specific procedure that may or may not be covered by an individual's insurance policy.

When Francois Bodhuin, director of information services, was asked to help reduce the number of claims being denied by insurers, he decided to make it easier for nurses to check the accuracy of treatment codes when submitting them to insurers.

His initial plan was to put conventional Ethernet access points at hospital nursing stations. That way, nurses who roamed from station to station could plug notebook PCs into the network, check treatment codes and send changes over the medical group's LAN to insurance companies.

After some research, Bodhuin said he elected to install a wireless system called RoamAbout from Enterasys Inc., a subsidiary of Cabletron Systems Inc. in Rochester, N.H.

Mobile Medical Communications

Data is transferred along a conventional Category 5 Ethernet LAN to a device in the ceiling that includes a network interface card and radio transceiver. The Ethernet cable also powers the access device, so no separate power supply is required. From there, the data is transmitted to a wireless radio card in each notebook's PC Card slot.

Nurses simply turn on their notebooks and log on to the network at speeds of up to 11M bit/sec.



FRANCOIS BODHUIN: The wireless LAN system is resulting in big savings

The wireless network connection also gives nurses access to the hospital's intranet, pharmacy and labs and provides e-mail.

South Jersey Medical System's setup broadcasts data at Ethernet speeds over a distance of about 120 feet, which means nurses can work in close proximity to the access unit, located above nursing stations, or even move away from the station and into patient rooms while maintaining a network connection. And as a nurse takes a notebook PC from one nursing station to another, the radio card in the PC goes into a roaming mode, much as a cellular phone does, locking onto the access site with the strongest signal.

Insurance denial is costly to both the hospital and patient, Bodhuin said. Although he wouldn't give a specific figure, he said, "We're talking six-figure dollar amounts [in hospital savings], easily."

According to Bodhuin, that's a pretty good return on investment, considering that PC radio cards cost about \$200 apiece and each of the 28 wireless access points cost about \$750. ▀

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CLIP AND SAVE SO THAT YOU DON'T HAVE TO CARRY THE WHOLE MAGAZINE AROUND IN YOUR SHIRT POCKET JUST TO REMEMBER THIS ONE FASCINATING FACT.

How Prudential Is Moving Online

Prudential Insurance Company of America Inc. CIO William Friel talked last week at the company's IT headquarters in Roseland, N.J., with Computerworld's Sami Lais about the future of e-commerce in general and insurance electronic business in particular.

Q: How is the business of Prudential driving information technology development?

A: We're using IT to compete, so, like any other business activity, we have to make it more efficient, make sure we deliver more value. We're using computing to reduce costs and to compete.

Q: What's next? What are your business units asking for?



FRIEL: E-commerce on tap at Prudential

A: E-commerce is the most requested. There are three things driving the model: the Internet, wireless communications and bandwidth. Everybody wants to get that last mile. The way to do it is the thin-client model. There are too many fat clients. They're difficult and expensive to manage. But they'll be around for a long time.

We're still in the first stage. All [of the Prudential] businesses have data that users can access and transactions they can perform, whether it's to get a quote for auto insurance, trade equities, maybe move funds. The next stage will be a truly e-commerce-based model.

The transition between clicks and bricks will be seamless.

But over the Internet isn't the only way or even necessarily the best way, or the way that people prefer to sell or buy insurance. People want personal contact.

In fact, we've found that with insurance, people are using the Internet for doing

DEBORAH RADCLIFF/HACK OF THE MONTH

Honor thy customers' cards

IN JANUARY ALONE, a half-dozen electronic businesses lost credit-card data to thieves. And just last month, SalesGate, which operates an e-commerce billing system for small online merchants, saw more than 3,000 customers' credit-card numbers posted on the Web.

Amazingly, the crackers used widely available scripts to manipulate the operating systems to gain root or administrative access to the systems and download plain-text credit-card information.

At SalesGate, the attackers exploited a known vulnerability in Microsoft Corp.'s Internet Information Server.

Chris Keller, founder and secretary to the board of Buffalo, N.Y.-based Internet Management Services Inc., SalesGate's parent company, wouldn't divulge details but said the attack occurred just after a system upgrade.

"We were keeping credit cards in hard copy in books only. And any other customer information on the server should have been encrypted," he said. "But then we restored our Web server, and this particular credit-card information had been previously coded into that Web server by a prior administrator."

The best security practice is to not store credit-card information on any Web-connected machine, said Ian Poynter, president of security consulting firm Jerboa Inc. in Cambridge, Mass.

This, of course, is impossible for busy sites whose customers want their credit cards stored for reuse or for sites that conduct their own credit-card processing.

Another strong deterrent is to encrypt credit-card files and store them safely away from the Web server. But security professionals point out that transactional systems have a difficult time pulling credit cards out of encrypted files, so most organizations store credit-card data in plain text.

"You want to architect your system so that the machine storing those cards is as far removed from

the Internet as possible," said Al Potter, manager of network security labs at ICSA Labs, a division of the International Computer Security Association in Carlisle, Pa.

"Behind the first firewall is a Web

server. Then behind the Web server, put another firewall. And behind that firewall, put a wee, bitty little [connection] to the transaction server that stays open just long enough to validate the transaction," he says. ▀



Deborah Radcliff is a freelance writer in Northern California. Contact her at DeRad@aol.com.

research, and when they're ready to buy, they make the phone call. For that, they want personal contact.

Q: Will people be buying insurance in the same way they withdraw money from ATMs?

A: No, we must continue to build functionality, and we've got to save time for our customers. [At Prudential] every individual business's budget includes e-commerce and adding financial transaction capabilities.

Q: Why haven't we seen in the insurance industry the kind of business-to-business exchanges we've seen in other industries?

A: The insurance industry has been behind in that aspect of technology. It's been later, as an industry, to take advantage of the Internet. Many players believe you can sell auto and home insurance over the Net.

Q: When Prudential's businesses come to you in the IT department for e-commerce applications, what's their biggest concern?

A: One, security and two, privacy. Privacy is very important. You have to do

the security and privacy well to come out ahead on the trust equation.

You have to have robust authentication that's accepted by the courts. You have to be able to go to the Web site and say, "Yes, I want to do this transaction," and have that accepted in a court of law.

You need encryption — and I'm not going to say unbreakable, because there's no such thing. But it has to be strong enough that it'll cost you more to break it than you'll get from breaking it.

Q: How do you see IT handling privacy issues?

A: Well, first, you have to have ethical companies and an agreement that they will ask, "How can we use your information?" That's why we don't believe in using cookies to track where you've been without first getting your consent.

I think consumers are going to demand the ability to control who gets access to their cookies. You can do it to some extent today, but some companies will punish you if you don't play. They'll say, "We can't notify you of a sale," or something like that. ▀

Just a reminder
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Dodging a Virus, Not a Lousy Class

Week 5: Pat suffers his first e-mail virus and learns that sometimes the student knows more than the teacher

THE DAY BEFORE my Check Point Software Technologies Ltd. FireWall-1 class, I thought it was going to be pretty boring. That is, until I got a strange e-mail from my boss's boss, Mark, the director of network services. It just said "check out these links." Then our webmaster jumped into my office, saying she had also gotten a weird e-mail from Mark. "Oh s!*&" flashed through my brain, because while the e-mail was addressed only to me, she had received the same.

I brought up Microsoft Corp. Exchange Administrator to check the queues and disconnected the mail transfer agent from the Internet. Disconnecting prevented the e-mail from sending itself out to all of our remote mail sites, which would have been catastrophic both from the hit on network performance and the fact that we would have been proliferating a virus. The queue was full this e-mail, trying to send itself to every address in our company.

As it turned out, a colleague had sent Mark the Visual Basic script for the VBS.Freelink virus. What saved us was that he was running Panda Anti-Virus on Windows 2000, so the attachment wasn't in any of the e-mails he had sent from his mailbox.

This is a limitation in the version of Panda used under Windows 2000 Server. Needless to say, we had no antivirus software on our Exchange server either. So an e-mail went to the e-mail/server administrator, stating that we needed some by next week. This was our first e-mail virus, and we were lucky this time. Which brings me to my class.

I have learned the hard way about the instructors who teach classes like this. The expectation is that the instructor has a thorough real-world understanding and experience of the subject — or at least knows more than I do!

One of the other students was the director of security consultants for a

big phone company. It is because of this guy — I will call him Sean — that I stayed in the class.

The first day was pretty boring, and considering that we paid \$4,000 for the four-day class, I didn't feel it was worth \$1,000. We learned the basic graphical user interface of FW-1, but everytime someone asked a question, the instructor's answer was, "We'll get to that" later.

The Magic Stuff

Sean broke out the new laptop he just got, which can boot with either Linux or Windows 98. But the real magic stuff was on Linux. I connected my laptop to his and slurped down everything he had, and the class decided to make a field trip during lunch to get blank CDs. Sean gave us 3GB worth of free software such as utilities, hacker tools and anti-hacker tools.

Of course, I was up every night of the class till 2 a.m. burning the CDs on my portable burner for the guys. But, hey, these classes are for networking, right?

Day 2 was definitely more interesting. A couple of the guys made a comment about these Nokia Corp. (www.ipsilon.com/products/index.html) network appliances that run a

stripped-down version of the BSD Unix variant and Check Point FW-1. They're cheaper to buy than a new workstation, plus you can set them up at remote locations and administer them remotely.

So on Day 2, we learned more about the management of FW-1 and the basics of the Policy Editor, which lets you edit the policy on the firewall about what you allow and don't allow through the network. We also learned about the Network Address Translation Editor, which lets you edit proxy configurations for translating internal nonaddressable IPs to addressable ones.

I was beginning to not like the instructor very much, and the rest of the class felt the same way. Everytime the instructor didn't know something, he would just say, "Hmmm, yeah. Right."

But we learned a lot from Sean. I'm going to try and persuade my boss to let him come and consult for two days on our security policy.

Demo Attack

On Day 3, the natives got restless. After lunch, while the instructor was talking about the Anti-Spoofing and SYNdefender pieces of FW-1, Sean mentioned that he could launch a denial-of-service attack against these very elements of FW-1 running on our firewalls. We watched as Sean spoofed out three addresses, sending out packets to all the firewalls in the class. In about one minute, all the alarms on all the firewalls were going off, signaling a SYN attack. And we sat helpless, not able to even get to the console of the firewalls because the alarm boxes kept popping up. Funny in the classroom, but I'm now going to have to contact Check Point to see what can be done about it.

Since the firewalls were running on NT (Nearly Technology, according to Sean), I felt very comfortable learning the process. On Day 3, I learned how to work virtual private network (VPN), antispoofing and other things that were on my laundry list of items to learn in class. And then on Day 4, we learned probably the most important piece: the SecureRemote client.

This was important because this is how I'm hoping to have all of our remote Exchange sites connect to us. It's becoming more difficult to get static IPs on dial-up connections — both analog and Integrated Services Digital Network, as well as our laptop warriors in the field. With SecureRemote, we can allow them to have Dynamic Host Configuration Protocol-assigned addresses and then connect via VPN through their Internet service providers back to our Network Operations Center.

On my way to the airport, I received a page from the office — the first one all week. Apparently someone has been using our file transfer protocol (FTP) server as his own little OC3 file server! There were 2GB of games on the hard drive, and one of them was a stolen version of id Software Inc.'s Quake 3. I happen to know one of the guys at id Software, so I told him I would e-mail the FTP logs and all the info I have gathered on the group, which is a lot. They were too stupid to hide their tracks. I'd like to work with him on it, since it will involve

THISWEEK'S GLOSSARY

Network appliance: A specialized device that can access the Internet or private networks to perform defined tasks such as browsing a Web site or answering e-mail.

Network mapping (NMAP): A utility that scans large TCP/IP networks to discover ports that might be vulnerable to hackers.

SYN attack: Also known as "SYN flooding," this type of online attack exploits a flaw in the TCP/IP protocol to gain entry to a server and tie up multiple access points.

Dynamic Host Configuration Protocol (DHCP): A protocol that automatically assigns or "leases" an IP address to each user.

File transfer protocol (FTP): The basic method for exchanging files on the Internet.

Optical Carrier Level 3 (OC3): The speed of data transmission on an optical network, expressed as a multiple of the base (OC1) speed of 51.84M bit/sec. OC3 is 155.52M bit/sec.

LINKS:

www.symantec.com/avcenter/venc/data/vbs.freelink.html: Learn more about the VBS.Freelink virus.

www.checkpoint.com/products/firewall-1/index.html: Information about FireWall-1.

www.symantec.com/avcenter/venc/data/vbs.freelink.html: Information on the Freelink virus from Symantec Corp.'s antivirus research center.

www.pandasoftware.com: Information about Panda Software's antivirus software Panda Anti-Virus Platinum 6.0.

the authorities and I can maybe learn a little from the experience. Next week, I will begin my internal investigation, implementing some of the new items I learned in class and hopefully testing a new intrusion detection system, CyberCop from Network Associates Inc. ▀

■ This journal is written by a real security engineer at a real company, whose name and employer have been disguised for obvious reasons. It's posted weekly at www.computerworld.com and at www.sans.org to help you and our security manager — let's call him Pat — better solve your security problems. Contact him with comments or advice at www.computerworld.com/security/index.html with the subject line Pat's Journal.



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• Protecting your Company's Most Strategic Assets

Discover IT Leaders' application of Internet security as it relates to E-commerce and privacy issues as well as their view of up-and-coming technologies and standards to watch.

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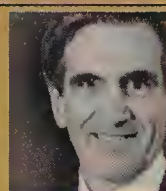
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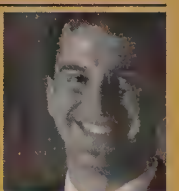
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Samsung Debuts Two Flat-Panel Monitors

Samsung Electronics American Inc. in San Jose has introduced two flat-

panel monitors, the SyncMaster 150MP and the 170MP. Both function as monitors or video displays for use with any video device. The 15-in. 150MP costs \$1,287; the 17-in. 170MP costs \$2,620. www.usa.samsungsemi.com

IBM Optimizes Web Appliance for Win 2k

IBM officials said last week that the company will offer the A100

Web Serving Appliance, an integrated Web-hosting server for service providers and enterprises. The server, which is approximately the size of a pizza box, can be installed in about a half-hour, compared with two and a half hours for

hosting systems that may involve multiple devices and require operating system server software installation, according to IBM. There will be three models of the new device, two of which will use the Intel Pentium III 650-MHz central processor unit. The third model will use the 750-MHz Pentium III.

The A100 has been optimized to run on the Windows 2000-based operating system and Web server application. Coupled with IBM's acceleration technology, it can deliver a 70% performance boost over Intel-based servers that haven't been specifically tuned to run on Windows 2000, according to IBM and Microsoft Corp.

Pricing for the A100 runs \$6,000 to \$16,000, depending on the model and configuration. The first units will begin shipping at the end of the month, IBM said.

www.ibm.com

CA Launches Linux ARCserve Software

Computer Associates International Inc. in Islandia, N.Y., last week rolled out ARCserve IT 6.61, storage management software for Linux. It offers data protection, automation, device management and remote centralized administration across Linux products by Red Hat Inc. in Research Triangle Park, N.C.; Caldera Systems Inc. in Orem, Utah; TurboLinux Inc. in Brisbane, Calif.; and SuSE Inc. in Germany. ARCserve IT costs \$1,395.

www.cai.com

Veritas Rolls Out Cluster Server App

Veritas Software Corp. in Mountain View, Calif., released Cluster Server for Windows NT last week. The server enables customers with Windows NT-based applications to create clusters of two to 32 servers. The software can also monitor up to 256 clusters from a single console. It allows applications such as Microsoft Exchange or Lotus Notes to be transferred from one server to another without losing time during a fail-over. Pricing starts at \$3,500 per server.

Veritas also launched Global Cluster Manager, software that manages fail-overs for server groups and remote locations. The software works with Cluster Server for Solaris and will be available in June. Pricing information isn't yet available.

www.veritas.com

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Low-End Laptops, And an Excel Extra

Yes, you can buy a new laptop pretty cheaply, but is it a good value? Also, a neat spreadsheet add-on. By Russell Kay

JUST A YEAR OR TWO AGO, many organizations were starting to replace significant numbers of desktop computers with laptops. But that was before the \$500 business desktop computer. Still, if you really need a computer to go — and lots of folks do — there's no substitute for a notebook computer, even though there may not be much money available to buy one.

With that in mind, I took a look at a few low-end laptops, beginning with a new machine from Compaq Computer Corp. It's not labeled with any of Compaq's existing brand names — no Presario, Prosignia, Armada or iPaq label in sight. Instead, it's called the Compaq Notebook 100, and with its \$1,099 price tag, it's aimed right at the most price-sensitive section of the market.

What you get is an Advanced Micro Devices Inc. (AMD) K6-2 475-MHz CPU with 32MB of RAM (however, 4MB of that is dedicated to the onboard Accelerated Graphics Port, so you net out at 28MB), a 5GB hard drive, a built-in 56K-bit/sec. modem and a single PC Card slot.

The 12-in. Super VGA screen uses a passive-matrix LCD that's dimmer and provides less contrast than the thin film transistor (TFT) displays I've gotten used to. This is a three-spindle machine with onboard floppy and CD-ROM drives. It weighs in at 6.7 lb. You can get

an active-matrix display for an additional \$400, which also buys you an extra 32MB of RAM (but again, 4MB goes to graphics).

Alternatively, for \$1,299 Compaq will sell you its Prosignia 150, which has a slower (380-MHz) AMD K6-2 processor and smaller hard drive in a slightly different case. However, it does have a 12-in. TFT display. And a quick tour of price-comparison Web sites reveals that you can get similar bargains on notebooks from Toshiba America Inc., Acer America Corp., Hewlett-Packard Co. and IBM. At those price levels, nearly every maker is using dual-scan displays and low-end CPUs, and the CD drive is sometimes optional.

Personally, I won't ever recommend a notebook that doesn't have an active-matrix screen. The display quality makes a tremendous difference in usability. I'd choose smaller and brighter over larger and dimmer every time. If you're spending \$1,000-plus on a computer, you shouldn't buy one that's harder to use and harder to work on just to save a couple of hundred dollars. When dual-scans used to cost \$800 less than TFT displays, it was easier to justify choosing them, but no more.

With that in mind, the one bargain that stood out from the rest was IBM's ThinkPad 390X, with a 400-MHz Celeron processor, 64MB

of RAM, a CD-ROM drive and a 12-in. active-matrix display, at a street price as low as \$1,299 (\$1,995 list).

All of these low-priced laptops are hefty. Don't look for anything under 6 to 7 lb.

Slick Spreadsheet Add-on

I recently tried out a clever product that augments Microsoft Corp.'s Excel spreadsheet in a really useful way. Basically, it addresses the needs of the manager who has to keep track of a number of areas (such as different departments or sales regions) on a regular

basis. You may need and get updated reports and figures from all those folks, but consolidating them is a tedious cut-and-paste affair. There's really no good way to automate the process with Excel's native capabilities.

Distributed Spreadsheet, developed by Communications Enhancement Products Inc. in Scottsdale, Ariz., tackles that problem in two ways.

First, it lets you set up a workbook that has separate pages for each department or sales territory, as well as one or more summary

sheets that consolidate them. Each of the individual sheets is assigned one or more designated owners.

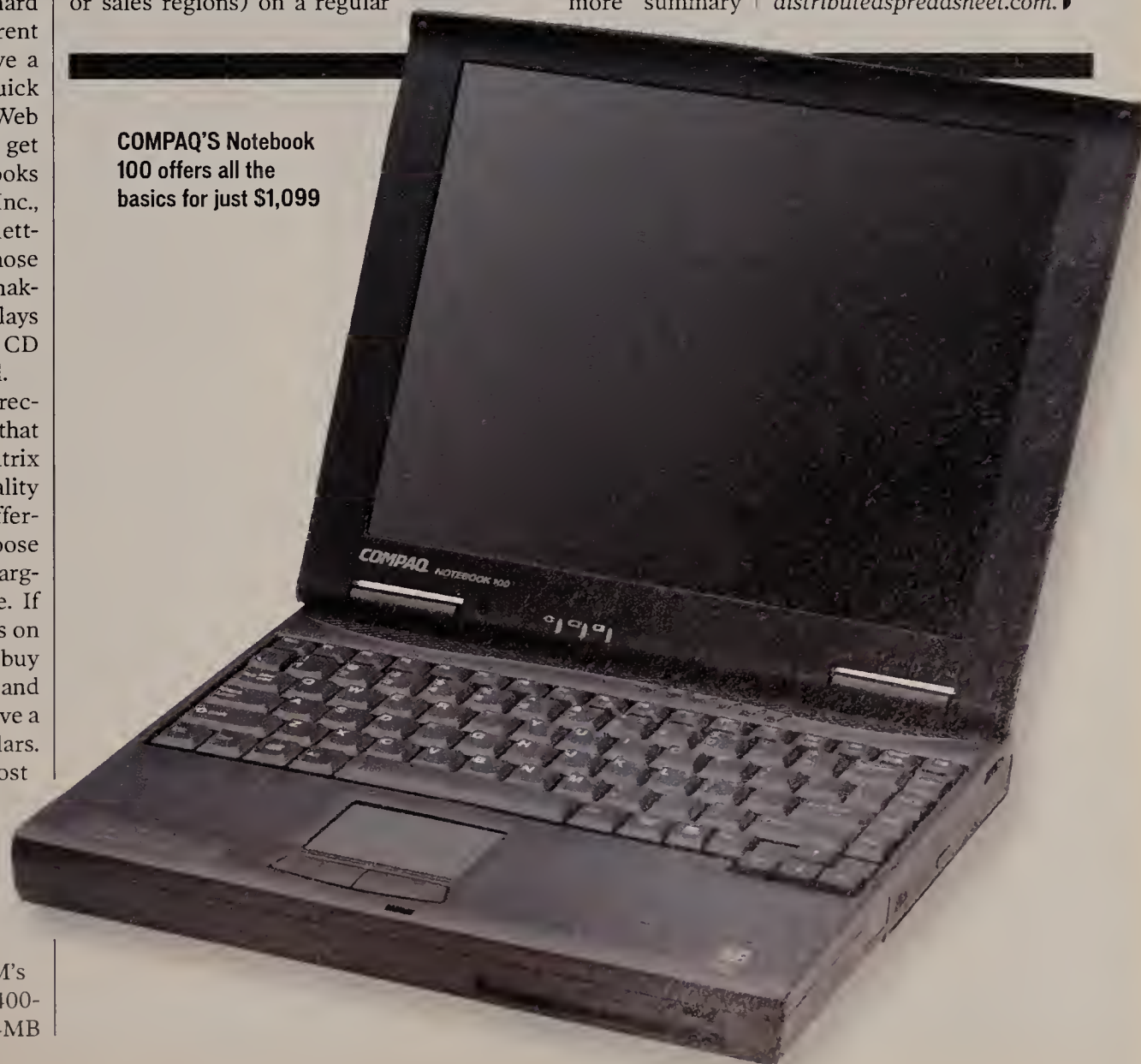
Second, with a couple of clicks, it lets you e-mail all the owners blank copies of their worksheets and ask for updates. When replies come in, you can automatically gather them and consolidate them with a single menu selection. You can even send out reminders automatically.

What's handy about this system, besides the labor savings, is the fact that each person gets to see only the particular data he's authorized to see.

Another nice feature is that Distributed Spreadsheet also makes it simple to retain old versions of spreadsheets without renaming them. It works with any e-mail system that's compliant with the Messaging Application Programming Interface. It's entirely file-based and can be cleanly uninstalled, leaving no residue other than the workbooks you've created.

Distributed Spreadsheet integrates itself into Excel nicely, adding a menu item. It costs \$129, and a 30-day trial version can be downloaded at www.distributedspreadsheet.com. ▶

COMPAQ'S Notebook 100 offers all the basics for just \$1,099



Directory Services Markup Language

BY CHRISTINE McGEEVER

DIRECTORY services provide the best way of naming, describing and finding information and resources in a system while managing the relationship between those resources.

Directories [QuickStudy, March 13] typically store and manage information — including names, addresses, phone numbers and access rights — about each user in an enterprise. In addition, directory software also stores and manages access to detailed information about a company's information technology assets, including people, business processes and resources for internal use.

The Internet is built on a foundation of distributed directories, most of which maintain similar information using similar directory applications. That foundation is quite old in Internet time. Early protocols, such as X.500, are still used for aspects of directory management. Also, the distributed structure defined early on is still in place: Directory services are distributed across a network, with each distributed service maintaining a portion of the global database. To the user, the entire directory of network resources is accessible from the local server.

New Technology Needed

But the pending demands of business-to-business e-commerce will likely max out these older technologies. For example, developers and vendors will be hard-pressed to write applications and utilities that can meet the data-handling requirements of the automotive spare parts industry, which is expected to generate millions of daily Internet transactions when it's up and running.

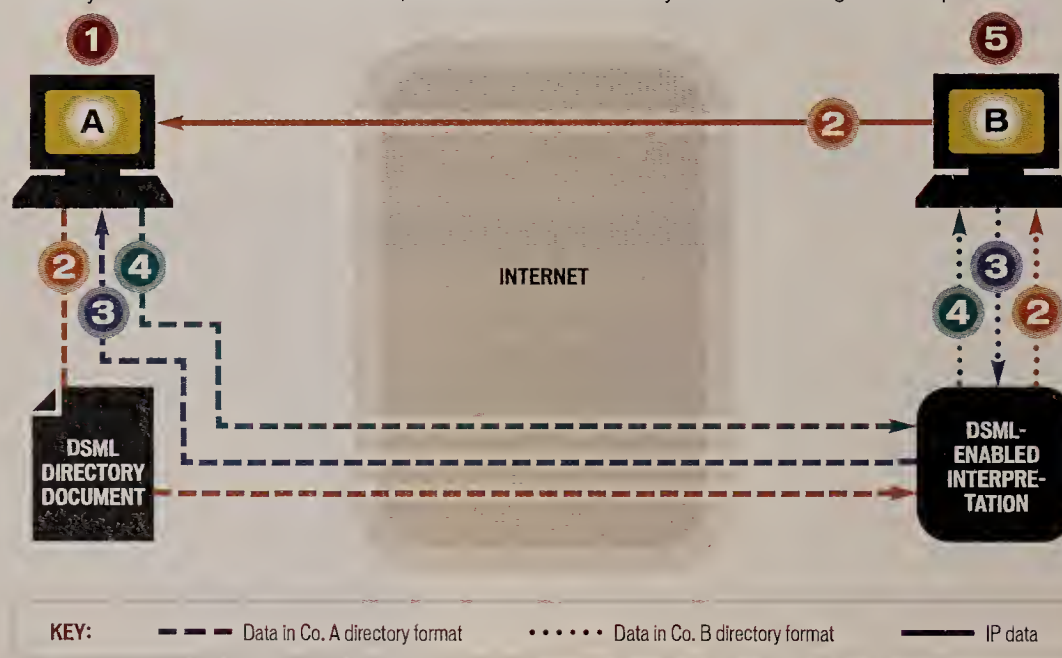
Luckily, the numerous business-to-business exchanges announced this year are still a long way from going live, and vendors are making headway

DEFINITION

Directory Services Markup Language (DSML) is a proposed standard for using XML to define the data content and structure of a directory and maintain it on distributed directories. DSML gives developers a simple and convenient way to implement XML-based applications on the Internet. Such support is crucial to e-commerce applications.

How DSML Enables E-Commerce

Company A wants to do business-to-business electronic transactions with Company B. Company A's XML-based application uses DSML to expose its native directory structure in the form of an XML document. This document can be transmitted via the Internet to other DSML-enabled applications, which can intelligently access user profile and resource information in the original directory. In essence, this process extends the functionality of Lightweight Directory Access Protocol across firewalls, but without a loss of security. Here's how it might work in practice:



in standardizing directory services. One effort, Directory Services Markup Language (DSML), builds on the predicted dominance of the content-tagging language XML to provide support in e-commerce applications. On the Internet,

DSML should make directory information available to a world where information in distributed directories is maintained in different schemas.

DSML was created by an industry group spearheaded by Bowstreet Software Inc., a

start-up in Portsmouth, N.H. Last year, Bowstreet convinced IBM, Oracle Corp., the Sun/Netscape Alliance and Novell Inc. that such a standard was needed. Last July, the group announced its intent to develop it, and on Dec. 7, it turned over

the DSML 1.0 specification draft to the Organization for the Advancement of Structured Information Standards, a non-profit consortium for XML e-commerce standardization.

Establishing Standards

The idea behind the DSML standard is that business-to-business exchange applications can make use of the scalability, replication, security and management strengths of Web directory services without having to re-engineer either the Internet's infrastructure or existing software.

DSML specifies standardized ways for defining directory schemas, including specific XML tags and other metadata information, that are similar to the document type definitions in the Internet programming language HTML, which are managed as directory entries.

XML applications request both data and schema information from directories and consolidate them into one document. Network managers can enable DSML on current directories by simply installing extensions. Lightweight Directory Access Protocol and current vendor application programming interfaces remain in use. Directories continue to work as in the past, except that DSML will enhance business-to-business e-commerce.

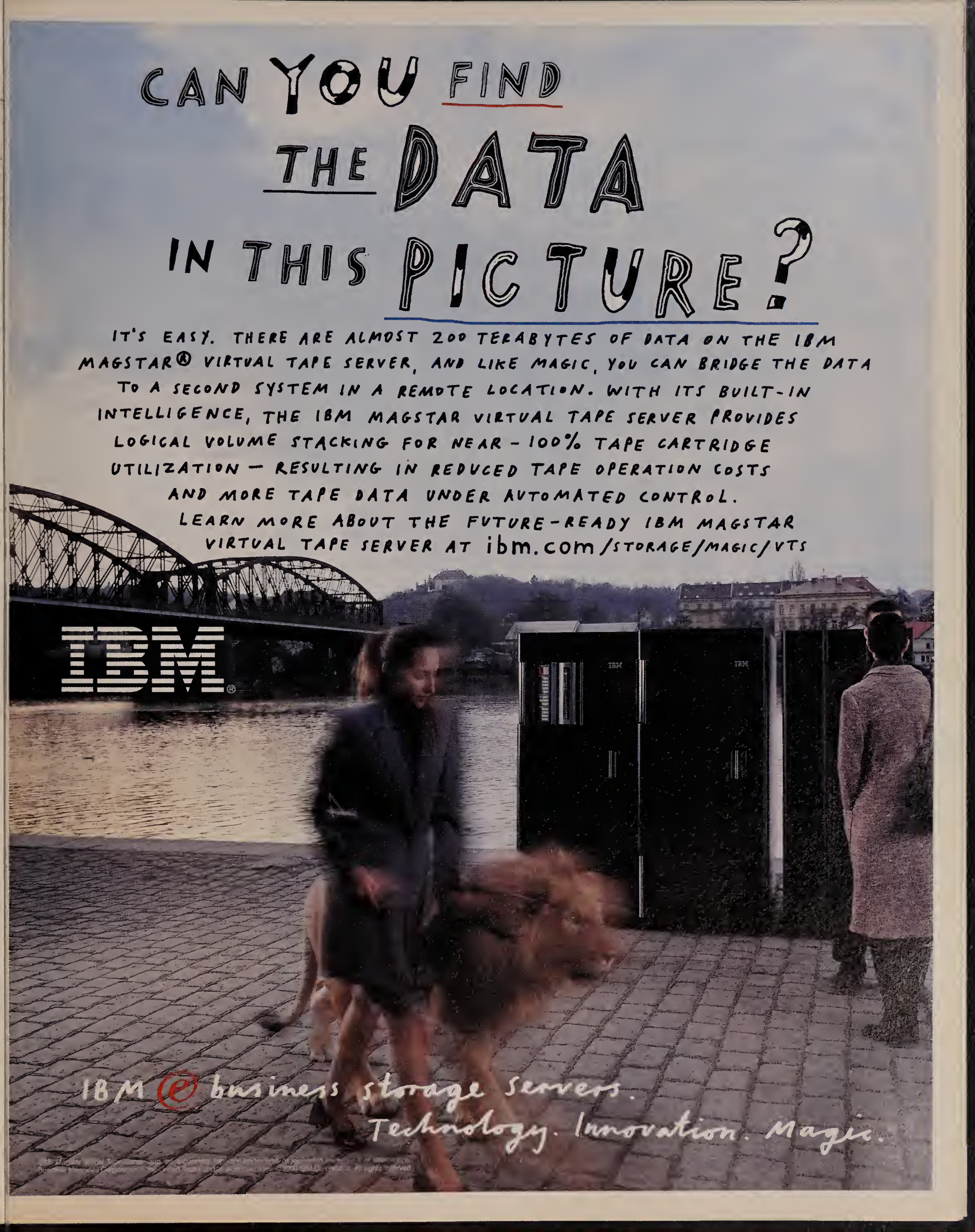
Although XML itself is still under development, vendors are now supporting it in products and embracing it wholeheartedly as the e-commerce language that will make business-to-business viable.

A combination of XML and DSML will be essential to Internet directory services, enabling a new generation of applications that use directories more effectively. In particular, DSML will be important to supply-chain and customer service applications, all of which rely heavily on customized presentation of data. DSML metadata descriptions will be the tools for that job. ▀

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What Can Slow Down E-Commerce Site Performance?

Actually, the question should be, What doesn't slow down a commerce Web site? The answer to that question is much shorter. Transaction bottlenecks can occur almost anywhere along the long and sometimes complex chain of operations that make up an online shopper's purchase. We've highlighted the worst, from a merchant's point of view, along with ways they could be prevented.



Merchant Server



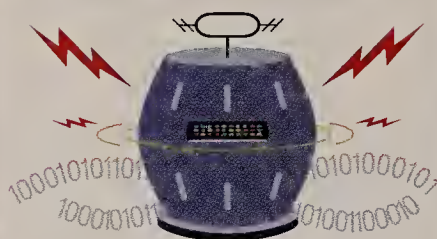
Bottlenecks:

- Overloaded firewalls
- Maxed-out network switches
- Inadequate server connections

Potential Solutions:

- Distribute services in different geographical areas
- Use graphics caching

Back-end Databases



Bottlenecks:

- Inefficient, poorly written code

Potential Solutions:

- Rewrite code and optimize
- Use database caching

Application Server



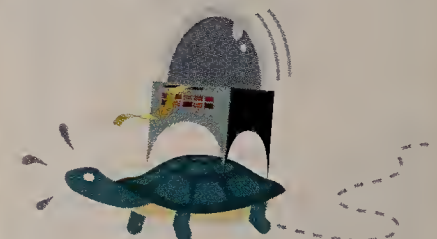
Bottlenecks:

- Slow software performance
- Inadequate hardware to drive app

Potential Solutions:

- Upgrade hardware
- Use load balancing
- Start clustering
- Tune boxes through thread pooling

Payment Processor



Bottlenecks:

- Slow network connections
- Slow processing

Potential Solutions:

- Reduce network latencies
- Increase bandwidth
- Take approval process out of real time using conditional acceptance

GRAPHIC BY X-PLANE (WWW.XPLANE.COM)

USING AN e-commerce site is much like driving a car on a highway. The speed at which a request gets from Point A to Point B depends on the traffic it encounters and the stops it must make.

As Web sites gain interaction capabilities, they must also interoperate with more potential bottlenecks. Firewalls and switches must check out requests before releasing them to the Web server. Application servers must first talk to back-end databases to determine a final destination. Payment information must be verified by a third-party credit-card service. Each operation acts like a tollbooth on a highway, slowing down the speed at which the request can be made. And since bandwidth is a finite resource, each request finds itself competing for space in an increasingly crowded pipe.

Slow performance isn't an option for an e-commerce Web site, however. Customers want faster processing and quicker navigation even as they're demanding more sophisticated features. Unfortunately, the most obvious solu-

tions to the problem of slow commerce sites — more bandwidth, more boxes, more servers — aren't always the most appropriate answers to the performance question.

Finding solutions to bottlenecks requires a review of every part of the e-commerce architecture. In most cases, the network needs some combination of caching, clustering and load balancing.

Caching In

One way to speed performance and reduce traffic is to store, or cache, seldom-updated content. This can mean pushing content to the network edge, where it doesn't travel through as many switches or servers.

When The Motley Fool Inc. began dispensing investment advice in 1995, static HTML pages dished up much of the information. "Back then, we didn't need a database back end. Now it's the heart of our system," explains Dwight Gibbs, "chief techie geek" at the Alexandria, Va.-based firm.

Today, The Motley Fool Web site, www.fool.com, is much more interactive. Users can access message boards, participate in discussions and listen in

on live conferences. Introducing more and more complexity inevitably degrades performance. "Nothing is ever going to be as fast as static HTML," says Gibbs, "so the question is whether hardware can keep up."

Today, Fool.com uses a series of Compaq Computer Corp. machines running Windows NT, Microsoft Corp.'s Internet Information Server (IIS) and transaction servers. F5 Networks Inc.'s Big-IP routes traffic among machines.

Using Akamai Technologies Inc.'s content delivery service last year, Fool.com achieved great performance gains. Cambridge, Mass.-based Akamai's proprietary technologies reside on a global network of 2,000 servers. The Akamai system routes each request for content to servers that are geographically closer to the customer so the request travels a shorter distance along the Internet.

By off-loading requests for specific graphics-intensive pages to the Akamai network, Fool.com fields fewer requests through its servers, firewalls and switches. Existing bandwidth gets used more efficiently. Gibbs claims that Fool.com realizes 30% to 50%

gains in performance by using Akamai's service.

Although it can improve delivery speed, "caching does not affect transaction performance," says Walt Smith, chief engineer at Atlanta-based e-commerce consulting firm iXL Inc. But delivering multimedia, although difficult, is just one bottleneck along the way.

Balancing the Load

Craig Johnson, senior wide-area network engineer at DiscoverMusic.com, similarly concluded that transaction performance was most critical. His Seattle-based company delivers via the Internet music samples heard on the best-known CD commerce sites. Interruptions mean lost revenue.

DiscoverMusic.com first began in 1996 as Enslo Audio Imaging International, a subsidiary of Muzak LLC. The decision to spin off the division as a separate publicly traded company coincided with the need to improve the transaction performance of the site. As investors began evaluating the company, they raised a significant concern: If you base revenue on service being available, what is your disaster-recovery plan?

Back then, the service, hosted by MCI WorldCom Inc. and running on just two Intergraph Corp. servers, couldn't quickly recover from an interruption. Lengthy delays occurred when the second server picked up a request. And at that time, DiscoverMusic.com was delivering fewer than 2 million streams of music per month.

To provide continuous disaster-recovery service, DiscoverMusic.com built server farms in Seattle and Herndon, Va., with full redundancy in power, services, hardware and software, all capable of responding to the same request. To assure transaction performance, Johnson needed a product that could reliably handle the streaming audio requests and route each request to the appropriate server.

He chose F5 Networks' Big-IP and 3DNS products. These run as network appliances, minimizing impact on the network hardware and software infrastructure. During the initial tests, "we were high-fiving each other," Johnson recalls. DiscoverMusic.com found that it could interrupt the audio stream and have a second server pick up the request without missing a beat. The company now serves 60 million to 70 million audio streams per month and has experienced no interruptions of service since initiating the new setup in November 1998.

Routing requests to the least-busy server won't solve performance problems at all e-commerce sites, however. Given the varying levels of computing power in machines that support e-commerce applications and the types of features that must be supported,

Continued on page 86

Lots of things can slow — or stop — an e-commerce transaction. Here's what you can do to prevent them. *By Dawne Shand*

BANISH BOTTLE NECKS

BANISH BOTTLE-NECKS

Continued from page 85

certain sites employ more complex load-balancing solutions.

"The problem with traditional load balancing is its round-robin approach," says John Puckett, CIO at Waltham, Mass.-based toy retailer Toysmart.com Inc. In a traditional load-balancing system, if a server configuration had a new PC and an old Cray machine, the least-busy server would get the request. Problems occur when the older server gets a request it can't handle.

Toysmart.com doesn't run on Cray computers, but its configuration does include Sun Microsystems Inc. Solaris machines and a multitude of Compaq servers of varying computing power running Windows NT. To make the most efficient use of its existing server configuration, Toysmart.com implemented a switch from ArrowPoint Communications Inc. in Acton, Mass. It uses a rules-based engine to determine where a user request should be sent.

"Most people think about the appliances and connections more than the network and bandwidth," says Puckett. By caching graphics at the network, tuning the local cache of the server boxes and balancing server loads, Toysmart.com uses its existing bandwidth more efficiently. With these improvements, the company doubled its

capacity in terms of the number of pages its site can supply per minute.

Load balancing can happen at the server level as well as the switch communications level, says George Dodson, a member of the board of directors of the Computer Measurement Group Inc., an independent nonprofit organization in Turnersville, N.J.

Called clustering, this technique of grouping independent servers to work as a single system can often improve overall site performance.

The Motley Fool and Toysmart.com both use Microsoft Cluster Server, which is bundled in the enterprise edition of Windows NT. This connects two servers so one can take over for the other in case of failure. Whereas load balancing increases performance, this type of clustering improves a site's reliability more than its speed.

Load balancing within the server, or clustering, made a difference at ETrade Group Inc. Begun in 1982 as the first online brokerage service, ETrade implemented its e-commerce service in 1996. Back then, it managed 60,000 accounts. Today, it manages 1.5 million.

According to Gary Kattge, director of quality assurance at ETrade, customers look for reliability and speed. Given the constant introduction of new content and features, that's no small feat.

Caching of content and clustering of back-end databases have yielded the greatest performance improvements at ETrade. Its clustering technique puts more than one server into the same box, increasing the speed at which one server can take over for another.

ETrade's system focuses on routing a request to the server best suited to handle it — something Kattge calls "services packaging." It looks at what features are most often used and guides those requests toward higher-capacity servers tuned to handle them.

Consider ETrade's "smart alerts," which notify an account holder when an event, such as a stock hitting a cer-

tain price, occurs. "These represent a huge flow of data," says Kattge. "We set aside certain parts of the system tuned to handle these specific requests. We don't distribute the load evenly."

Working the Back End

Still other companies find that their performance bottlenecks occur once the application server tries to communicate with the back-end databases. Database caching techniques significantly helped out customers of Interlink Communication Systems Inc.'s (ICS) sites.

Clearwater, Fla.-based ICS resells data communication hardware to other businesses. It started an e-commerce site, Interlinkweb.com, two years ago and has introduced stores targeted at specific customers.

ICS found that its customers were mainly interested in getting reports on their account status. The company's site simplifies the purchasing procedures and order-checking processes for corporations. It allows corporate procurement officers to name other buyers and set credit limits. Because 90% of their purchases are made through purchase orders, ICS's customers must know where their accounts stand.

To do this, ICS links its Web-site ordering with the Dynamics accounting system from Great Plains Software Inc.

"Our goal is to maximize the customer experience with as much functionality as possible without adding inherent inefficiencies," says Paul Dietrich, ICS's chief technology officer. For a reporting-intensive site, this is a challenge, he says.

Although ICS is a Microsoft shop that runs IIS, Site Server and Commerce Server, it recently abandoned Microsoft ActiveX components for communicating with the back-end databases. Using these map query objects meant repeating certain executions that slowed the generation of reports.

ICS now relies on stored procedures, using SQL 7.0, for handling the reporting-intensive features. Stored procedures are like caches for database requests. If a report requires five steps, the stored procedure has the first three already completed. Dietrich says this change increased reporting execution speed by a factor of three to five.

In essence, an e-commerce site must scale with the number of users, respond reliably and quickly, and optimize its use of bandwidth. When it comes to performance, caching, clustering and load balancing, applied at the appropriate junctures, make these three goals more attainable. ▀

Shand is a freelance writer in Somerville, Mass.

Get Close to Your E-Customer

Great e-commerce site performance may not help at the customer end, explains Paul Scarpa, a senior analyst at The Yankee Group, a Boston-based market research firm. The Internet itself can be a significant bottleneck.

When a customer on the East Coast requests something from a server on the West Coast, the number of connections the request makes along the way and the traffic it encounters are beyond the control of the e-commerce company.

Top commerce sites speed site performance these days by literally moving some pieces closer geographically to customers, says Walt Smith,

chief engineer at iXL Inc., an e-commerce consulting firm in Atlanta. As incoming orders arrive from the different server locations, they're integrated off-line.

Companies like Akamai Technologies and Digital Island Inc. in San Francisco use local servers to reduce the distance that content travels over the network. However, as Scarpa points out, once an e-commerce site introduces a degree of personalization, caching content becomes much more difficult, if not technically impossible.

— Dawne Shand



YOSHIO KURTZ: Tuning improved the performance of the Proflowers.com site by as much as 400%

Proflowers.com

The problem: Keep Proflowers.com's online florist site from wilting under a 28-fold traffic increase from 30,000 visitors last February.

The infrastructure: Four Web servers running Windows NT and Microsoft's IIS 4.0.

The solution: Add servers and increase bandwidth capacity using CacheFlow Inc.'s network appliance and put the most graphics-heavy pages in Akamai's caching service network.

The results: Performance has been boosted by up to 400% overall. The main page's maximum download time of 50 seconds has been reduced to a very acceptable 15 seconds.

Started in San Diego in April 1998, Proflowers.com lets its users purchase flower arrangements directly from the grower. It recently merged with Flow-

erfarm.com, enabling the combined entity to provide flowers to customers around the world.

When Yoshio Kurtz, director of development, joined the company in May 1999, this Allaire Corp. ColdFusion site ran on four NT/IIS Web servers.

But users with slow modems could wait 50 seconds for the site's graphics-intensive main page to download during maximum traffic periods. Today, it takes only 15 seconds in the same situation, thanks to the site's new advanced caching techniques and infrastructure improvements.

Proflowers.com uses two complementary caching services from Akamai and CacheFlow to get these significant improvements. Proflowers.com selected 10 of its most graphics-intensive pages, representing 90% of its total traffic, and placed

them on the Akamai network.

Kurtz estimates that in its busy month of February, Proflowers.com paid Akamai \$2,000 to \$3,000. Proflowers.com installed the CacheFlow 3000 network appliance on its site in San Diego to cache all other graphics. Ninety-two percent of the site's content is cached outside the first network switch.

Kurtz's team also scaled the site's infrastructure horizontally by adding about 35 additional machines and servers, and vertically by adding more RAM and CPU power. The team also tuned the local cache of the Microsoft IIS to maximize its performance.

"I know of companies who have better equipment but don't get the performance that we do because they don't know how to tune these boxes," Kurtz says. Performance has increased anywhere from 200% to 400% since making this combination of improvements, he says. *— Dawne Shand*

CASE STUDY



Was it fear that drove 9 of the top 10 Internet companies to Network Appliance?

Call it fear. Call it prudence. Or just call it common sense.

Either way, one thing's sure. Those industry leaders know what happens when mission-critical data's unavailable. Revenues stop. Potential customers vanish. Reputations sour. In short, a single—even brief—data outage can plunge any of them waist-deep into one very ugly situation.



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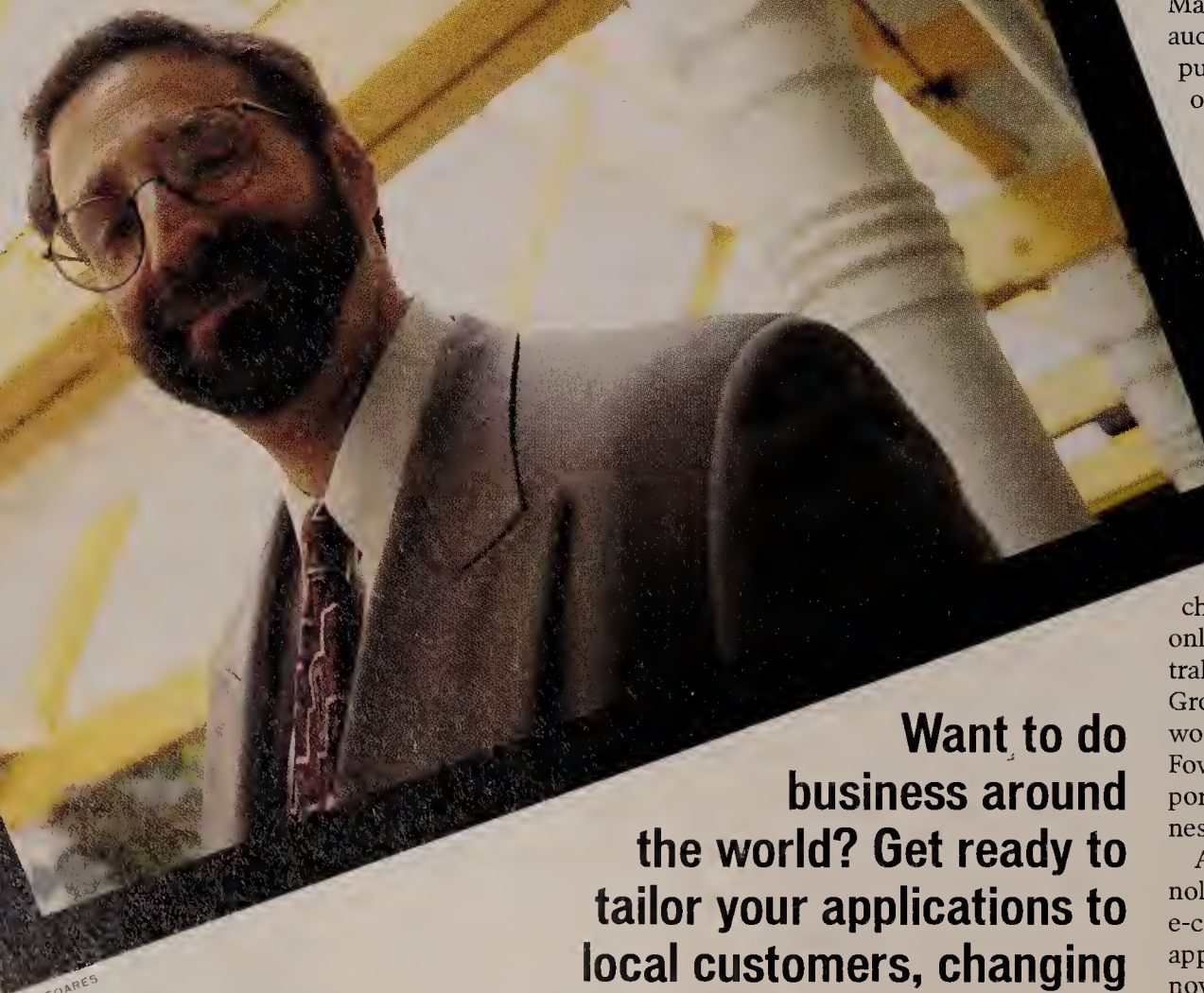
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NYPRO'S JAY LEADER
says Internet-based
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JOHN SOARES

**Want to do
business around
the world? Get ready to
tailor your applications to
local customers, changing
everything from language to
business rules to logos.
By Dawne Shand**

DONALD FOY, DIRECTOR OF ONLINE OPERATIONS AT Manheim Auctions Inc., didn't know that in the U.K., auctions for personalized license plates thrive. Once purchased, the clever plates can be sold by their owners rather than by the government.

That was just the first hurdle that Manheim faced as its Web site went global. Based in Atlanta, Manheim Auctions is the world's largest reseller of used cars and a pioneer in using Web technologies to auction vehicles online through "cyberlots." When Manheim expanded into the U.K. and Australia, it found that its new partners had lines of business that the original auction site didn't support. Its inventory database also had to accommodate different naming conventions (an American car's hood is an English car's bonnet, for example) and measurement standards (kilometers, not miles).

Even Manheim's corporate logo had to change. It originally depicted a globe that showed only North and South America. However, its Australian acquisition, Melbourne-based Fowles Auction Group, certainly didn't see itself as relegated to the world's nether regions. Foy recognizes that without Fowles' input, his team would have missed that important point. "We have to be sensitive to their business and culture," he explains.

As companies implement global information technology systems, they're learning that everything from e-commerce to enterprise resource planning (ERP) applications — meant to be used in uniform ways — now have to adapt to regional idiosyncrasies.

E-commerce applications are, by default, accessible to almost anyone in the world who has Internet access. Their extensive reach doesn't, however, automatically translate into global business. Victoria Bracewell-Short, who leads the globalization practice

at e-commerce consultancy iXL Enterprises Inc. in Atlanta, says clients often ask her, "Isn't this just a translation or content management issue?" But companies that treat it as such can run into problems. Asking for information as basic as a name, a mailing address or an e-mail address during initial registration can raise hackles in countries where citizens are nervous about giving out personal data.

"We [Americans] take it for granted that when we log on a site, it recognizes us and displays our preferences," says Bracewell-Short. But in Germany, she points out, there are much more stringent regulations governing how e-commerce sites gather customer data. For example, using cookies to collect customer preference data without telling the user is illegal there, so companies that hope to build online relationships with customers must adapt their technology plans accordingly.

Making sure a site doesn't break any laws isn't the only challenge. Bandwidth, connection speeds and browser usage make the global playing field anything but level. But e-commerce sites with global aspirations can take two tacks.

One option is to build one site for all users. If that audience is located only in the U.S., Finland and Sweden, for example, the weakest technology link isn't particularly weak and a single site could work.

However, if the audience includes the U.S., Greece, and Turkey, companies will need to consider building multiple regional sites that can accommodate weaknesses in telecommunications infrastructure and browser penetration.

You're Speaking My Language

General Motors Corp. in Detroit recently created GM BuyPower, a portal through which consumers can check out GM vehicles, find local dealers, view those dealers' inventories and set up financing. With its sights set on reaching 29 countries by the end of this year, the portal had to adapt its presentation of information as well as the business processes for each country.

BuyPower is a three-tier application running on Sun Solaris machines, models 450 and higher. An Oracle8 database contains the product and inventory information. BuyPower uses Netscape Enterprise for its Web server. Between the database and Web server sits Cambridge, Mass.-based Art Technology Group Inc.'s Dynamo 4.5 product suite.

Dynamo personalizes the information from the database so GM customers see only the products available in their markets, in the correct language. "We have processes for bringing content and inventory information in, country by country," explains Ron Shelby, GM's general director of e-commerce applications.

To manage international content creation, GM has created a centralized production center in Raleigh, N.C. With TeamSite 4.0 content management software from Interwoven Inc. in Sunnyvale, Calif., content can be created locally and then edited and posted to the Web site through a centrally managed process. "In a digital world, the need for standard processes becomes imperative," explains Lisa Baird, director of strategic marketing at GM. "We are running a worldwide brand tailored to each country."

By using an application server, BuyPower can adapt to the quirks of each region. The application server — the middle tier — does the grunt work for an application by processing requests based on the rules governing that user's region, without changing the layout or presentation of the information.

Separating this function from the database and the presentation layer has two positive effects. First, a sin-

gle source of data is more consistent and easier to maintain. The presentation of information can be modified in an infinite number of ways while it's being processed according to common business logic. Although BuyPower remains a single application, it can provide a different look and feel, as well as different information, to customers in various locales.

Second, by separating the business logic from the other two components, applications can adapt to greater complexity in business processes.

Inchcape Shipping Services Ltd., which built its business on managing local regulations for handling international cargo, built a three-tier application to handle its extensive documentation needs.

Inchcape is the world's largest independent shipping agency. It manages the logistics and documentation of cargo for its customers as their ships move from port to port. From its North American headquarters in Mobile, Ala., Senior Vice President of Global Business Information Systems Jim Ward and his team managed the development of World Trading System (WTS), which supports all the company's business processes and documentation needs.

The application runs on the Multitier Distributed Application Services Suite application server from Inprise Corp. in Scotts Valley, Calif. WTS contains six modules: customer service, export documentation, import documentation, logistics, liner finance and an electronic data interchange interface to customs. By separating these modules, WTS can adapt to an enormous range of requirements, from the rules for importing shoes into the British Virgin Islands to a customer's preferred mode of signing off on an inventory report.

Including the modules in the application server layer allows them to work together more automatically. For example, if a customer service complaint arises about damaged equipment, WTS automates the problem resolution process, from taking the complaint to issuing the invoice to doing the necessary accounting.

Localizing ERP Systems

If WTS represents the pinnacle of localization for a global IT system, then ERP applications sit at the opposite end of the spectrum.

ERP systems exist to standardize business processes. For a company that wants accurate, up-to-date inventory information on a global basis, the worst thing to do would be to decentralize the technology that tracks it. But ERP systems aren't immune to differences in language and business practices across borders.

For a company like The Gillette Co. in Boston, consistency of product — and therefore consistency of operations — is of paramount importance. Gillette installed applications from SAP AG and PeopleSoft

You can't dump a big, brawny ERP system into a less [technically] educated environment.

JAY LEADER, DIRECTOR OF APPLICATION DEVELOPMENT, NYPRO INC.

Inc. because they automatically create reports in different languages. "We select vendors who can satisfy global needs," explains CIO Pat Zilvitis. Although development work is done in Boston, deployment and screen labeling is handled locally to overcome language barriers.

Other companies approach globalization strategies differently, allowing for more decentralized control where factories produce products for local customers. Nypro Inc., a plastics molding company based in Clinton, Mass., operates in 12 countries and uses its global presence as a selling point. To meet the needs of global customers, Nypro runs an ERP system from Chicago-based System Software Associates Inc. called eBPCS.

Building plants in China and providing them with networked ERP systems is the latest project for Jay Leader, Nypro's director of application development. He points out that it's no more feasible for him to modify code written in Chinese than it is to have Chinese employees operate systems in English.

The success of implementing these global applications in different environments often depends on that area's level of technological sophistication. "You can't dump a big, brawny ERP system into a less [technically] educated environment," says Leader.

He says he believes that Internet-based applications, with their capacity to personalize what each users sees, represent the best hope for localization of content, because one system can personalize content and data sources for each user. For ERP, localization is more difficult because the systems aren't meant to be flexible. Nypro, however, puts control over ERP data extraction and manipulation in local hands.

"That's as good as I can do," Leader says. ▀

Shand is a freelance writer in Somerville, Mass., who specializes in emerging trends for business and technology.

Seeing Isn't Necessarily Buying

Delivering products to Bangkok is much more difficult than shipping them to Boston.

Just because customers from around the world can access your site, that doesn't mean they can actually order products from your site.

In August 1999, Forrester Research Inc. in Cambridge, Mass., reported that 85% of the online companies it interviewed couldn't fill international orders because of the complexity of cross-border shipping.

"I'm surprised the e-commerce companies don't know how difficult it is to ship items," says Pat Klein, vice president of services at Vastera

Inc. in Dulles, Va. Shipping products abroad is a vastly more complicated procedure than shipping products locally and involves the myriad treaties and laws of international trade regulations.

A small number of companies, combining consulting services in the import/export business with a software applications offering and online content, are attempting to help companies automate the process of meeting each country's import and export regulations. A sampling of them appears at right. — Dawne Shand

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Teamware Offering That's Tailor-Made

MS2's Web-based collaboration tool promises to speed development cycles

BY DAVID ESSEX

GOOD collaboration tools are tough to find, and they're even tougher for large projects to live without. The founders of MS2 Inc. learned that the hard way while shepherding product development themselves.

The collaboration tools they tried failed to facilitate a smooth, efficient workgroup environment. So they built MS2 Accelerate, a Web-based groupware portal for coordinating collaborative functions.

Successful product launches turn on rapid execution and follow-through, which depend on tight communication among all members of a launch team, inside and outside a company.

The engineering and marketing departments, for example, must be in sync to avoid Dilbertian foul-ups. And everything has to be turned around within development cycles that are now measured in months rather than years.

MS2 spent a couple of years building MS2 Accelerate and quietly installed it at several customer sites last fall, including 3Com Corp.'s home-networking division. Now the venture-funded start-up, flush from a recent \$20 million round of financing, is sitting pretty with a purportedly out-of-the-box Internet application. The product solves a daunting problem for rapidly developing companies that together make up a \$22 billion worldwide market, according to MS2.

Getting on the Same Page

Though similar to groupware and other generic collaboration tools, MS2 Accelerate has a vertical appeal that makes it a new animal on the software scene. "We've built an application from the ground up specifically for product teams," says Michael Maciag, MS2's vice

president of marketing and business development.

MS2 Accelerate encapsulates much of its creators' knowledge of product development. It comes with hundreds of customizable "best practices" templates that outline procedures for performing

important tasks well, such as validating product concepts with customers.

It also automates many project management tasks, such as document approval and scheduling, so managers aren't forced to create automated collaborative systems piecemeal using existing office applications and e-mail or groupware like Lotus Notes and Microsoft Exchange.

Team members stay apprised

of a project's progress by visiting Accelerate's Web site. It dynamically lists deliverables and deadlines and links key documents. E-mail is built-in, so users don't have to go outside the application to communicate.

"Usually, they have a live Web site within a day of the start," says company President and Chief Operating Officer Brett Bachman. That claim is largely confirmed by customers (see story at right). "One of the key benefits they've been getting is everyone on the team is on the same page — literally," Bachman says.

While information technology isn't MS2 Accelerate's primary market, Bachman and Maciag say corporations will find the software useful in creating e-commerce sites and in managing large, in-house development projects.

Recursive Logic

Much of the organizational friction that MS2 Accelerate was designed to lubricate is a direct result of the tight labor market, which causes personnel churn that requires frequent retraining, makes teams that are already in place work less effectively and often drives up salaries.

Ironically, it may also be MS2's thorniest challenge as a company. Located in Mountain View, Calif., in Silicon Valley, the company is doubling its workforce annually — no easy task. The main prerequisite is product management know-how, and Bachman interviews

almost every potential candidate. "Every job offer that goes out from MS2 is going to be contested by three or four other companies," Maciag laments.

Competitive threats could develop if existing groupware and marketing software vendors try to grab a piece of MS2's action. "We operated our company for about two years in stealth mode," Maciag says. "Now that we've come out publicly, we expect more competition."

If that happens, creativity, rapid response and sure-handed execution will be called for, and MS2 has a weapon that's no longer so secret that can help. ▀

Essex is a freelance writer in Antrim, N.H.

the buzz

STATE OF THE MARKET

Customers Tell the Story

There are more ways to build a project collaboration system than there are projects. Possibly the best way to check out the competitive landscape for MS2 is to take a look at two of the company's earliest customers.

Aspect Communications

Aspect Communications Corp. in San Jose builds customer relationship portals. It uses MS2 Accelerate to coordinate the work of product teams scattered around the world. The company rejected vertical product and marketing-automation packages. A document-based system built on Lotus Notes was deemed too expensive.

Instead, approximately 30 people in Aspect's marketing department and more than 100 in engineering now use MS2 Accelerate to collaborate on documents such as sales tools and collateral that are published to a central Web site by managers who might not recognize HTML if they saw it.

"From my perspective, [MS2 Accelerate] really helps the flow of information," says David Puglia, Aspect's vice president of product marketing.

While it's too early to quantify the results, Puglia says Aspect's product release cycles have been shortened, quality has improved and the work is being done by fewer people.

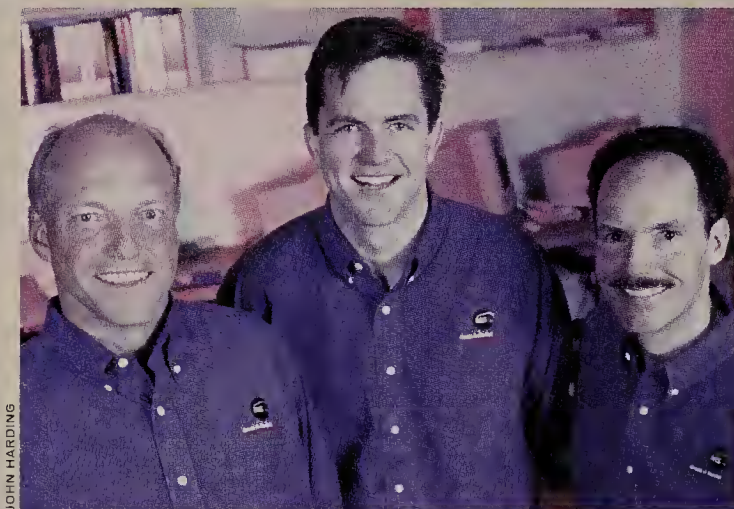
Net Perceptions

Steven Larsen, senior vice president of marketing and business development at Net Perceptions Inc. in Minneapolis, tries to be diplomatic when he discusses the automated sales and groupware tools his team tried. John Harris, the company's director of field marketing, is more blunt: "The warm and cuddlies [from MS2 Accelerate] are an anomaly," Harris says. "Most of the other software stinks."

Development schedules at Net Perceptions, which makes Web site personalization and cross-selling software, were becoming a little scary last fall. "The reason we got MS2 was we were a one-product company, and we were going from one product to four products in a year," Larsen says.

Since adopting MS2 Accelerate last year, Net Perceptions has released five upgrades and new products — something that wouldn't have been possible otherwise, according to Larsen.

Larsen says a major benefit is the software's ability to provide a framework around documents created with Net Perceptions' existing document-creation tools. — David Essex



CO-FOUNDERS (from left to right) Jeff Hudson, Michael Maciag and Brett Bachman built MS2's Accelerate application specifically for product teams

MS2 Inc.

Location: 2440 W. El Camino Real, Suite 601, Mountain View, Calif. 94040-1400

Telephone: (650) 967-7300

Web: www.ms2.com

The technology: MS2 Accelerate, a Web application for managing product development cycles through a corporate portal

Growth potential: MS2 estimates the worldwide annual market for its product is \$22 billion.

Why it's worth watching: MS2 Accelerate could be a godsend to any group that has a major software project to build in Internet time with a series of deadlines.

Company officers:

- Jeff Hudson, co-founder, chairman and CEO
- Brett Bachman, co-founder, president and chief operating officer

- Michael Maciag, co-founder and vice president of marketing and business development

Milestones:

- 1998: Company is founded.
- Feb. 7, 2000: MS2 Accelerate is unveiled at the Demo 2000 show.

Employees: 60

Burn money: \$33 million backing from Hummer Winblad Venture Partners and others, plus a \$20 million mezzanine round in February

Customers: 3Com Corp., Aspect Communications Corp., Net Perceptions Inc. and Centigram Communications Corp.

Red flags for IT:

- Vendors of existing marketing and groupware tools could try to mimic MS2 Accelerate by adding product development modules.
- The Silicon Valley labor crunch could hamper MS2's ability to grow.

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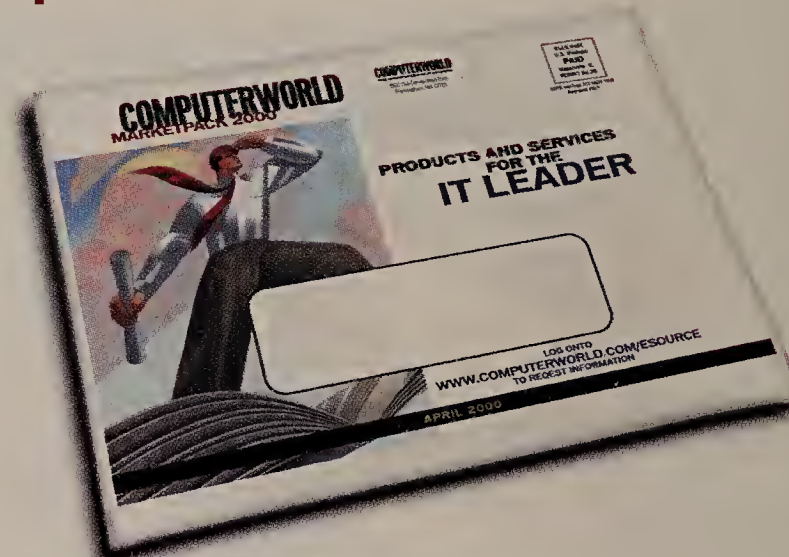
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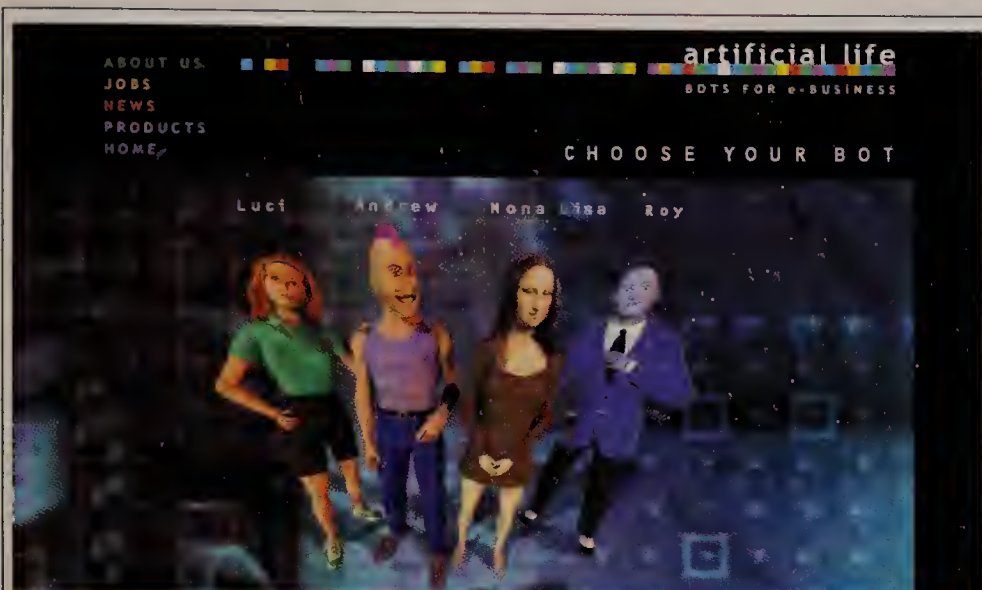
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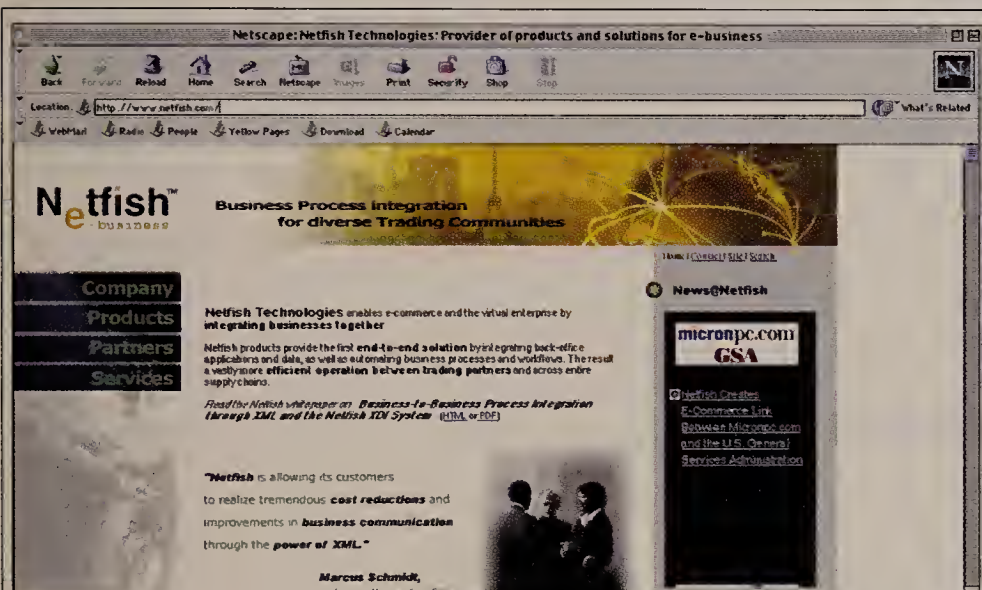
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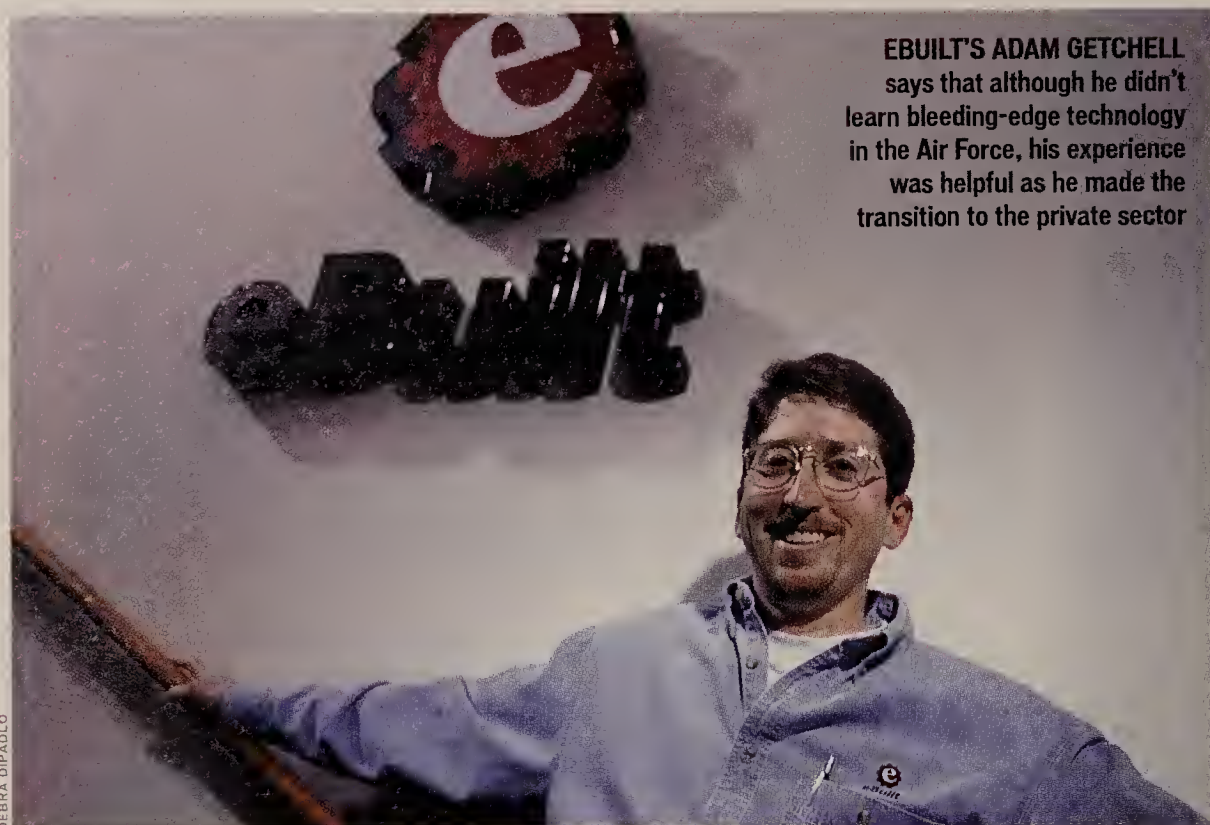
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EBUILT'S ADAM GETCHELL says that although he didn't learn bleeding-edge technology in the Air Force, his experience was helpful as he made the transition to the private sector

DEBRA DIPADLO

Post-Military Maneuvers

Who: Adam Getchell

Company: eBuilt Inc., Irvine, Calif.

Title: Senior database engineer

Previous title: Database administrator

Branch of the service: U.S. Air Force

Skills learned in military: Unix administration, resource management, people skills (identifying who's a fit for which project), business analysis

Skills learned since leaving the military: Sybase Sequel Server and PowerBuilder, Oracle, data modeling, data warehousing

BY DEBORAH RADCLIFF

NOT SURPRISINGLY, recent and soon-to-be military veterans with information technology experience are finding the private sector quite lucrative.

But the challenge while still in uniform is for military technologists to build their skills on bleeding-edge technology used in private-sector business applications, something many military IT shops don't offer. Because of these unmatched skill sets, veterans still earn about 10% less than their private-sector-trained peers when they enter the corporate workforce, according to Lucas Group in Atlanta.

Thank heaven for their discipline, adaptability and can-do attitude, which carry many a veteran into higher-paying leadership roles.

In his previous career as a U.S. Air Force officer, Adam Getchell worked in some pretty exciting environments.

In the early 1990s, he built computer-controlled test systems for the Rocket Propulsion Lab at Edwards Air Force Base in California's Mojave Desert.

After that, Getchell built cryogenic test systems at NASA, something he's particularly proud of because all of the instrumentation needed to work at minus 200 F.

He also worked as part of an alliance among the Air Force, NASA and Lockheed Martin Corp. on the X33 prototype Reusable Launch Vehicle for the next-generation space shuttle.

Getchell's test systems replaced an antiquated push-button system with programmable logic controllers. He wrote all of the testing applications and sequences that ran on the Unix boxes, which he procured and installed himself. Natur-

ally, being the only one with any Unix background, he also administered the machines.

For the last two years he worked at NASA, he held the position of Unix analyst and administered the human resources machines accessed by 800 NASA employees. "I found I liked the Unix administration and database work," he says.

When he left for the private sector in 1998, Getchell went straight to work at an Internet start-up called AdForce Inc. in Cupertino, Calif.

Civilian Contrasts

He immediately doubled his pay, despite the fact that most military veterans tend to enter the civilian workforce on the lower end of the pay scale. But the other thing Getchell says he noticed was the lifestyle change.

"It was much more relaxed than the government. Here were guys wearing sandals," says Getchell, who was used to uniforms and ties. He found another difference: long hours.

Then there was the technology. Military systems are generally a year or two behind corporate technology, say former government workers and hiring officers. At AdForce, Getchell experienced his first "trial by fire" in bleeding-edge technology.

"There's no training in the military that adequately prepared me for this," Getchell says. "I had to learn the Internet, which in itself is such a unique entity. I had to learn databases on the Internet — concurrency, caching and other techniques I would not have otherwise run across. I had to learn all the buzzwords."

When AdForce changed hands in 1998, Getchell moved to another Internet start-up, eBuilt Inc. in Irvine, Calif., which designs and builds e-commerce architectures.

Helpful Military Experiences

While Getchell can't claim cutting-edge IT work in the military, he does insist that the Air Force gave him the Unix foundation he needed to succeed in the private sector. "Just about every database we create here is on a Unix platform," he says.

But just as important are the soft skills he picked up in the military — diplomacy, project management and business analysis, to name a few.

Mustering Out

The most common private-sector IT jobs for military vets:

Systems analysts: Mostly Unix administration (the military has been slow to adopt Windows NT)

Programmers: Cobol, Ada and, increasingly, Java

Project engineers

SOURCE: MILITARY RECRUITMENT DIVISION, LUCAS GROUP, ATLANTA

Top traits sought by civilian recruiters:

- Independence
- Flexibility/adaptability
- Resourcefulness
- Leadership

Vets' Best Bets

More than technical ability, soft skills like leadership appeal to private-sector hiring managers, according to Mike Deveraux, vice president of the military recruitment division at Lucas Group, a national recruiting firm in Atlanta.

"The military isn't so much training technologists for the corporate world; they're training people to lead and motivate and manage," Deveraux says.

Beth Cygon, a former procurement specialist in the U.S. Air Force, says adaptability is another trait sought by private-sector employers.

Her first job out of the military was to procure billing support and member services applications at America Online Inc. So she quickly learned the technology and was promoted within a year, an accomplishment she attributes to her military background.

"The environment here at AOL and that in the military are very similar. They're both constantly changing," Cygon explains. "As long as you're organized and you know how to lead the process, you can adapt to anything."

— Deborah Radcliff

For example, in the military, Getchell learned to work with dynamic people from all races and walks of life. "Some of those people were easy to deal with. Others were difficult," he says. "I also interfaced with customers, those who needed things tested in the cryogenics and rocket propulsion labs. I had to help them figure out what exactly they needed and how I could technologically support those needs." ■

Radcliff is a freelance writer in Northern California.

APPLICATIONS DEVELOPER

Applications Developer for manufacturer in Ohio.

Duties: Participate as a project team member on the Manugistics team. Provide analysis, design, implementation and testing of the Distribution and Production System and integration components as part of Oracle's CPG solution. Provide design and coding skills needed to tune and support packaged application software solutions, program in a client server environment using Oracle Release 7. x or higher and Oracle tools (PL/SQL, Forms, and Reports) and develop program and system documentation per company's needs. Interact with and support users of the company's Distribution and Production Planning System from all over the country, to enable the company's customers and suppliers to reorganize their supply chain systems.

Requirements: Bachelor of Science with a major in Computer Science, Computer Applications or Management Information Systems; and three (3) years of experience in the job described OR three (3) years of experience as an Application Consultant, Software Engineer, Software Designer or Computer Programmer. Experience must be in Oracle Release 7.x or higher, Oracle Tools and Unix.

Hours: 40 hrs/wk, 8 am-5 pm Mon-Fri.
Salary: \$55,584.88 per year.

Send two (2) resumes and cover letters (no calls) to: ESSp Prgrms, REF # 5837JD, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216.

Software Engineer: Must have a Master's Degree in Computer Science or Electronics & Communications Engineering with 3 years of experience or a Bachelor's Degree in Computer Science or Electronics & Communications Engineering with 5 years of experience in software development, 3 years C++ programming and knowledge of Java programming. Experience in PC, Sun and HP hardware platforms, specifically HP-UX 10.30 & 11.0 a must. Will be responsible for object oriented software analysis and design using Booch, Rumbaugh, and UML methodologies and Rational Rose case tool. Will also be responsible for database design using Versant OODB and Oracle. Must be able to perform software implementation using programming languages C++ and Java. Will be responsible for software testing for large scale telecommunications high-performance applications, including network restoration, network management and network simulations systems on a UNIX system using POSIX threads and X.25 communications protocol. Salary \$60,000 - \$65,000. Send resumes to Spectrum Software, Inc., 6855 Jimmy Carter Blvd., Suite 2150, Norcross, Georgia 30071, Attn: Human Resources.

SPL World Group is an International builder of business solutions. We are currently looking for individuals with Natural/DB2, Natural/Oracle, Natural/Construct, Natural/Adabas, Visual Basic, Smalltalk, C++, Java, Cobol, OO skills to work in our development centers in California, New Jersey and Chicago as:

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San Francisco, CA 94105
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Fax: 415-541-0224, EOE
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COMPUTER

Informix Software, Inc. has job opportunities in the following locations: California (Menlo Park, Los Gatos, Oakland, Sunnyvale, LA area and other locations); Colorado (Denver and other locations); Oregon (Portland); Massachusetts (Burlington, Boston, Westboro, and other locations); Georgia (Atlanta); Kansas (Lenexa); Vienna, VA; Florida (Miami, Orlando, Tampa); and in other areas across the United States:

- * Software Engineers (All Levels)
- * Software Development Managers
- * Programmer Analysts
- * Systems Analysts
- * Technical Support Engineers
- * Finance Manager
- * Sales Engineer
- * PC Support Technician
- * E-Commerce Regional Solution Development Manager
- * ATG Engineer
- * Project Manager

Reqs: BS/MS and 0-5 years of experience.

For immediate consideration, send your resume with salary requirements to: Informix Software, Inc., Dept. ASJ049E, Professional Staffing, 4100 Bohannon Drive, Menlo Park, CA 94025; fax: (650)926-6873. E-mail: resumix@informix.com. EOE M/F/D/V. No phone calls please.

Technosoft Corporation, a fast growing consulting company is looking for Programmer/Analysts, Software Consultants and Software Engineers with experience in the following skill sets/specialties:

Hardware Platform: IBM 3090, ES 9000, RS 6000, HP 9000, Sequent, PC Pentium, Sun Solaris, Sun Microsystems, Unix

Operating Systems: MVS/ESA, MVS/XA, VM, SUN/OS, AIX, HP-UX, UNIX, Windows NT, Windows 95, OS/2

Software: PowerBuilder, Visual Basic, Visual C++, C, C++, Delphi, Java, HTML, ECOMMERCE, Oracle, SAP, BaaN, Oracle Financials, JDEdwards, COBOL, Vision, MS Office Suite, Lotus Notes, Netwise Middleware, WEB Enabled Tools, CORBA, NETDYNAMICS, COLD FUSION

Database: Oracle, DB2, MS Access, Sysbase Systems, Informix, XDB, DBA

Project Management Tools: Microsoft Project, Microsoft Office Suite

Administrators: UNIX, HP-UX, AIX, SUN, NETWORK ADMINISTRATION

Multiple positions exist. If you are interested please mail or e-mail your resume clearly mentioning the reference number CW410 to: **Attention Recruiting Dept., Job Ref #CW410, Technosoft Corporation, 31275 Northwestern Hwy., Suite 217, Farmington Hills, MI 48334. palani@technosoftcorp.com**

Sr. Consultant. Job location: Conshohocken, PA. Duties: Design, develop, customize & implement software programs using Visual C++ and object modeling tools incl. Visual Basic, VBA & Active Server Pages. Design, implement & test databases using SQL Server. Analyze, design, code & rewrite system & functional specs. using MS Word. Prepare complex design specs., work flow charts & structured charts. Perform system & integration testing. Analyze & assess clients' systems needs & recommend system solutions. Perform maint. & troubleshooting of system. Requires: B.S. (or foreign equiv.) in Comp. or Info. Sci., Eng. or related field and 3 yrs. exp. in the job offered or 3 yrs. exp. as a Consultant, Software Eng. or Systems Analyst. Exp., which may have been obtained concurrently, must incl.: 3 yrs. exp. performing system & integration testing, 3 yrs. exp. designing new software programs & 1 yr. exp. analyzing & assessing system needs & making recommendations. EOE. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Salary: \$73,000/yr. Send resume (no calls) to: Diane Tuccito, AnswerThink Consulting Group, 817 W. Peachtree St., Suite 800, Atlanta, GA 30308. Must have legal auth. to work in U.S.

SENIOR NETWORK ENGINEER to design, develop, analyze, test, implement and maintain various digital/analog switching and PDH/SDH transmission networks on optical fiber/microvave radio/coax cables and application software for the telecommunication industry based on C++; Establish and maintain x.25 and ISDN networks; Utilize PF-4, EPC-91, AM2-A, AM8e and other digital transmission analyzers; Test CAS MFC-R2 and SS7 signaling, configure and test E1 trunk parameters using automated tools; Assist in the design and optimization of wireless/cellular networks; Work with OSP engineers in the integration of switching and transmission networks. Require: B.S. degree in Electrical Engineering with four years experience in the job offered. Salary: \$62,000 per year, 8 am to 5 pm, M-F. Send resume to: Anthony Robert, Controller, Galaxy Engineering Services, 13000 Deerfield Parkway, Suite 107, Alpharetta, GA 30004; Attn: Job HM.

Software Engineer. Develop/integrate software solutions for workflow projects in 3-tier client/server, Internet-enabled management system to provide interfaces with corporate systems, using client/server architecture and development tools, Oracle, C++, Visual Basic, UNIX shell scripts, SOL, Java, HTML, Lotus Notes, traditional languages and tools, and PC-based tools such as MS Office Suite and MS Project. Requires bachelor's degree in computer science, MIS, or related engineering field, plus 2 yrs. experience as software developer, programmer/analyst, or programmer. Work exper. must have involved completing full life-cycle design, development, testing, & debugging of software system for workflow application. \$56,157-\$64,404/yr.; 37.5 hours/week. 8:00 AM - 4:15 PM (some weekend & evening hrs. required depending on project). Two copies of resume to M. Brooks, DWE-ALC; PO Box 7972; Madison, WI 53707-7972. Reference File No. C100945.

COMPUTER/IT Director, Business Solutions Development. Req. bachelor's of science degree (or higher) in engineering or computer science as well as 8 yrs.' exp. in job offered or in managing the development of strategy for, and implementation of, multinational sales and marketing information technology (IT) systems for pharmaceutical industry. Must be willing to travel up to 25% of the time. Manage the development of strategy for, and the implementation of, multinational sales and marketing IT systems for the pharmaceutical industry utilizing IT systems. Coordinate with Product Management, Quality Assurance and Product Development teams to develop marketing management software for company use. Coordinate with sales and marketing representatives to develop marketing software for individual customers. Salary range \$90,000 to \$114,000/yr dep. on edu. & exp. Send resume to Contracts Administrator, IMS HEALTH Strategic Technologies, Inc., 3445 Peachtree Road, Suite 1400, Atlanta, GA 30326 (FAX-404-841-4203). EOE.

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Internet Integration Sr. Consultant Job location: Conshohocken, PA Duties: Analyze & implement e-commerce solutions for clients by the design & develop. of internet, intranet & extranet solutions incl. e-mail messaging systems, electronic banking, messaging architectures as well as intranet enabled data warehouses, web-based client interface & internet & extranet security using Java (JDK, Servlets, EJB, Java Server Pages (JSP) and JavaScript), HTML, Netscape Application Server (NAS) and Netscape Enterprise Server (NES). Design & develop database solutions & develop distributed applications. Requires: M.S. in Comp. or Info. Sci., Eng. or related field and 3 yrs. exp. in the job offered or 3 yrs. exp. as a Software Eng. or Consultant. Exp., which may have been obtained concurrently, must incl.: 2 yrs. exp. analyzing & implementing e-commerce solutions and 1 yr. exp. developing web-based client interfaces using JavaScript and HTML. EOE. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Salary: \$85,000/yr. Send resume (no calls) to: Diane Tuccito, AnswerThink Consulting Group, 817 W. Peachtree St., Suite 800, Atlanta, GA 30308. Must have legal auth. to work in U.S.

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SAGA SOFTWARE, Inc. is a world-class software company delivering enterprise-class software products and services. So join our team of top professionals and help us set our clients' information and their business free. We are recruiting for all types of Systems Analysis Consultants, Staff Consultants, Project Managers/Leaders, System/Software Engineers, Programmer/Analysts, and other computer science professionals. Openings throughout the U.S. including: Reston, VA; Atlanta; Chicago; Dallas; Philadelphia; Sacramento and Irvine, CA; Denver; Fort Lee, NJ; and Bloomington, MN. We offer competitive salaries and comprehensive benefits. Please send your resume to: SAGA SOFTWARE, Inc., ATTN: Human Resources, Computerworld Ad, 11190 Sunrise Valley Drive, Reston, VA 20191. Fax: (703) 391-8340. E-mail: Lori.Nageli@sagasoft.com. For additional opportunities, see our ads under Computer or visit our Web site: www.sagafyi.com.

Sr. Software Engineer Duties: Design & develop web-enabled applications incl. video, multimedia & e-commerce applications using state-of-the-art tech, incl. MS-SQL Server, ColdFusion, JavaScript, Web Server & Windows NT. Document product requirements & perform system architecture. Lead tech. team to develop software code, conduct testing & implement commercial applications using HTML, JavaScript, ColdFusion & Front-Page Designer. Perform database design & develop using MS-SQL Server. Perform maint. & provide support for system. Requires: M.S. (or foreign equiv.) in Comp. or Info. Sci., Eng. or related field & 3 yrs. exp. in the job offered or 3 yrs. exp. as a Software Eng. or Program/Analyst. Will accept B.S. or foreign equiv. & 5 yrs. progressive exp. in the comp. ind. Exp., which may have been obtained concurrently, must incl.: 3 yrs. exp. performing database design & develop. & 2 yrs. exp. using JavaScript. EOE. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Salary: \$70,250/yr. Send resume (no calls) to: Robert Miller, CTG, Inc., 8260 Northcreek Dr., Ste. 350 Cincinnati, OH 45236-2296.

Engineer

SOFTWARE ENGINEER

Develop custom telecommunication protocols based on HDLC, TCP/IP for ISDN, SS7 and T1/E1 Switching Systems, including client resident switching systems. Establish requirements and address technical issues; resolve customer hardware/software issues by interfacing with engineering and provide post sales support. You will also perform software debugging and develop C and C+ Code from driver level to application code in Windows 95/NT and Sun OS environments to integrate data communication capability into a telecom switch. Knowledge of: C, C++, SOL, Client Server, ISDN, T1/E1, Sun OS and Windows 95/NT. Telecommunication protocols: HDLC, TCP/IP, data communication and Ethernet. BS or foreign equivalent in CIS, Computer Science or Computer Engineering and 2 years experience or MS in Information Systems in lieu of 2 years experience. Monday-Friday, 9:00am-5:00pm, 40 hours/week, salary: \$51,001/year. Send 2 resumes to Case #19990769, P.O. Box 8968, Boston, MA 02114.

Systems Consultant

Provide services to clients in design & development of business applications & systems to support client activities in finance, personnel, warehousing, inventory, material tracking, sales & general ledgers, develop modules, interfaces, menu screens, testing routines & implement & maintain systems with Unisys A-Series system, CANDE application development tools, DMSII data management system, WFL, & Novell Netware communication software; develop library routines for Year 2000 conversion project; convert client systems to Powerbuilder environment; provide technical support to users. \$59,529.60/yr. 40 hrs/wk. B.S. req'd in Computer Sc. or Computer Eng. B.S. may be foreign equivalent degree. 2 yrs. exp. req'd in job offered. May work at unanticipated locations in the U.S. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of resume & cover letter to the IL Dept. of Employment Security, 401 South State St., 7 North, Chicago, IL 60605 ATTN: Leonard Boksa. Reference #V-IL 22029-B. No Calls. **An Employer Paid Ad.**

System Engineer Duties: Install and set up Swedish Language application software and configuration; conduct system planning on www based infrastructure; Analyze and evaluate Global Telecommunications Processes for Network Planning and Operations; Monitor and maintain functioning of equipment to ensure system operates in conformance with specifications using knowledge in planning, design, and setup for Windows-Based systems with Stand Alone and Multi-User Architecture using Windows NT 4.0, Novell NetWare 4.11, Windows 95/98, TCP/IP, Client Software for ftp, http, and e-mails, UNIX, MS-Windows, OS/2, C++ and Java. Requires: B.S. in Computer Science or related field (employer will accept any combination of education and experience which is equivalent to a B.S. degree). 3 yrs. of exp. in the job offered or 3 yrs. of exp. as a Software Engineer or Technical Support Engineer. Exp. which may have been obtained concurrently must include: 3 yrs. of exp. with Swedish Language application software and 3 yrs. of exp. using TCP/IP protocols on Java Script. EOE. 40 hrs/wk. 8:00a.m.-5:00p.m. Salary \$63,450/yr. Send resume (no calls) to: Sam Manafit, Wizard Systems Inc., 31 Creeklane Drive, Roswell, GA 30076.

Software Engineer

Design and develop graphical user interfaces for business applications and integrate them with back-end databases in a client/server environment. Demonstrated ability in creating graphical user interfaces using the Microsoft Foundation Classes (MFC). Demonstrated ability in designing normalized databases and stored procedures for relational database management system (RDBMS). Demonstrated ability in connecting the front-end graphical user interface with the back-end database using connectivity tools such as ODBC, DAO, or RDO. \$76,252/yr. 40 hr/wk. 9 a.m - 5 p.m. Must have 2 yrs. exp. and B.S. in Comp. Sci., eng. rel. field/equiv. Send 2 resumes: Case #19983649, P.O. Box 8968, Boston, MA 02114.

SOFTWARE ENGINEER to design, develop, implement, document, and maintain application software for the telecommunication industry using object oriented techniques, C, C++, PL/SOL, Sun Workshop, dbx, Purify, Quantify, Make, Shell Scripts, and RDBMS such as Oracle and Rational Rose under Windows, UNIX, LAN, and DOS operating systems. Require: M.S. degree in Computer Science, an Engineering discipline, or a closely related field; Must have a demonstrated ability to perform the stated duties gained through previous work experience/academic coursework and projects; Extensive travel on assignment to various client sites within the U.S. is required. Salary: \$68,000 per year, 8 am to 5 pm, M-F. Send resume to: Roz L. Alford, CEO, American Systems and Programming Company, Inc., 3885 Holcomb Bridge Road, Norcross, GA 30092 Attn: Job SC.

DB2 Database Administrator (for IBM Mainframe):

Structured System Analysis, Design, Development, Testing, Integration, Quality assurance, Implementation, Performance Tuning, Support of Large volume online Transactions and batch applications, Release Inventory Management system, Product Inventory Management System, Automated System Testing, Site Disaster Recovery, Inter-Language Communication, In-house development of tools, in a multi-hardware and software environment over centralized database systems using DB2, IMS. Setting up of Test Environments in Development system Requirements: B.S. Computer Science, 40 hrs/Week, \$55/hour. Please send 2 copies of resume/letters of application to Job Order #2000-036, P.O. Box 989, Concord, NH 03302-0989

NETWORK CONSULTANTS

required. Electronics Engineer responsible for design, installation, configuration and testing of wide area network systems and gateway services for multiple servers and multiple network protocols.

Four years of experience required in the job duties described above. Must have proof of legal authority to work in the U.S.

Salary: \$90,000/year for a 40 hour work week.

Interested applicants should submit two (2) copies of his/her resume to Case #29983893, P.O. Box 8968, Boston, MA 02114. Ad paid by an Equal Opportunity Employer.

Software Engineer (Mechanical Engineering) Conduct research. Simulate cutting forces of machining operations on Windows and Sun UNIX OS using C++ and international application framework. Design RAD tools to cut costs of info. system development. Providing engineering support to clients. Req: Masters in Mechanical Engg/Computer, SC/Computer Engg with knowledge in Mechanical Engineering. Sal: \$55,000/year, 40/hr/wk. Job/Interview Site: Ann Arbor, Michigan. Please send this ad and resume to A2 Automation, Inc. PO Box 131335, Ann Arbor, MI 48113

International Programming & Systems, Inc. has employment opportunities for Sr. Systems Analysts/System Analysts/Web Developers with the following skills: e-commerce, Java, Oracle, Oracle Financials, Oracle developers/designers 2000, C++. Opportunities are available throughout the United States. Electronic responses are encouraged, to: cflavell@ipsamerica.com or mail resume to IPS, 1875 So. Grant Street, #300, San Mateo, CA 94402 (Fax) 650-572-8679. Principals only please.



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SOFTWARE ENGINEER: Knowledge in Functional-Hierarchy Diagrams, Object Modeling Technique Conventions and notations. Using Java, JDK (Java Development Kit), Visual Café and JBuilder. Knowledge in using HTML, Java Script, CGI and PERL. Job duties are Analysis of current procedures and problems to refine and convert the data to programmable form; determine output requirements; study existing systems to evaluate effectiveness; upgrade systems presently in use; develop, test and implement new software; correct systems/programs as necessary. Requires Masters in Computer Science with no experience required. 40 hours per week at \$ 73,000 per year. Please send resume to Case # 19990373, PO Box # 8968, Boston, MA 02114.

Consulting firm seeks Computer Professionals, Progg. Analyst w/B/S 2 yrs. and/or Software Engg. w/ M/S & 1 yr exp. with foll. skills sets. Will accept a combination of Edu. & Exp in lieu of a BS or MS degree.

- Cobol/400, AS/400, RPG/400
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- Java, Java Servlets, Java Swing, JDBC
- VB 5.0/6.0, ASP, COM/DCOM, Visual InterDev
- ActiveX Control Progg. & Object Oriented Prog.

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Apply w/resume to: Softek Information Services, Attn: Recruiter 762 Green Street #2F Iselin, NJ 08830.

Edgesys, Inc reqs Computer Professionals. Positions available req MS (or equiv) & 1 yr exp for Software Engr & BS (or equiv) & 2 yrs exp for Programmer Analyst.

- AS/400, RPG/400, COBOL/400
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- FoxPro, Developer 2000, Unix
- Java, HTML, DHTML, CORBA
- Frontpage, Visual InterDev

Excellent Benefits Apply to: Attn: Recruiter, 352 7th Ave, Ste 1215, NY, NY 10001.

Software Developer, N. Bethesda, MD. Provide scientific & technical leadership to programmers & scientists to design, develop & implement pharmacogenomic cgi/client/server software applications using algorithms for DNA, protein gene expression analysis, neural network Markov model & clustering. Work with C/C++, Perl, HTML & Oracle or Sybase databases & SQL for OS Windows NT & Unix. Required M. S. C. S. w/post-grad work in molecular biology & genetics & 2 yrs rel. exp. M-F, 40hrs/wk. Send resume to K Durazo, HR, Ref. 301, InforMax, Inc., 6010 Executive Blvd., 10th Floor, N. Bethesda, MD 20852.

Programmer Analyst, Stoneham, MA: Analyze, design, develop & implement RDBMS applications using Oracle, MS-SQL Server and Sybase. Perform Oracle Database Administration and performance tuning. Develop real-time applications using Client/Server technology. Developer 2000, Power Builder and Visual Basic. Req'd. Bachelors in Comp. Sci. or Engg. or Math. 2yrs. exp in job offered. 40 hrs/wk. 9a-6p. Mon-Fri. \$26.39/hr. Applicants should submit 2 copies of resumes response to Case # 19990133, P.O. Box #8968, Boston, MA 02114.

Programmer Analyst, Sr.

wanted by Info Technology Firm in Edison, NJ. Must have Masters in Comp Sci or MIS & 1 yr s/ware exp.

Respond to: HR Dept, Strategic Professional Services, Inc., 505 Thornall St, Ste 304, Edison, NJ 08837.

Academic Computing Specialist wanted to install, maintain, & support computing systems required for faculty research & teaching applications. Must have Bach. Deg. in Computing or business related field & 1yr. exper. in an acad. computing setting. \$18.50/hr. for 40/hr. wk. Send resume to Dept. of D., HR, Suffolk Univ., 8 Ashburton Pl., Boston, MA 02108. An equal opportunity employer.

Programmer/Analyst: Configure, maintain and analyze e-commerce web site. Manage web site content and system modeling. Design and develop front-end web interface. Implement back-end database design and storage. Req. MS or equivalent in CS or CIS; Proficiency in ASP, SQL and networking protocol TCP/IP. \$65,000.00/yr., 40hr/wk, 8:00 a.m.-5:00 p.m. Contact Human Resources, Place Collegiate Properties, LP, 101 Marietta St., NW, Suite 1050, Atlanta, GA 30303. email: job@placeproperties.com (no phone calls please)

Web Designer wanted by Computer Networking Co in New York, NY to dsgn, create & dvlp internet pages in Japanese. Must have Bach in Fine Art, Graphic Design or related field.

Respond to: HR Dept, Unitrendix, 747 Third Ave, 36th Fl, New York, NY 10017.

Programmer Analysts (5 positions) To analyze, design & develop application software using Informix and Oracle databases, Informix On-line 7.3, Informix-4GL, Informix ESOL-C, Informix-SOL, C and shell scripts on UNIX OS; develop and deploy applications on MS Windows using VB and Client/Server technology.

Programmer Analysts (3 positions) To analyze, design and develop applications using VB, MS SQL Server, Oracle, MS Access, HTML, GCI Programming, Visual Source Safe 6.0 and Visual Database tools under Windows 95, DOS and UNIX OS; document and develop logic, coding and provide customer support. Require BS or equiv. with conc. in Comp/Sci, Math or Engg (any branch) and 2 yrs exp. in IT field. Salary \$60,000 per year full time. Resumes to Orduison Technologies, 6055 Atlantic Blvd, Ste K2, Norcross, GA 30071.

Programmer Analyst, Boston, MA: Develop and maintain an interactive web site using Microsoft Internet Information Server 4.0 running on Microsoft Windows NT Server network operating system version 4.0 to access fares, make reservations and purchase of travel by an individual surfer. Establish WWW service for the company. Design, develop and implement a LAN and WAN. Provide technical support. Maintain database on SABRE for update fares information accessible to travel companies nationwide. Req'd. Bachelors in Comp. Sci. or Engg. or Math. 1 year exp in job offered. 40 hrs/wk, 9:00am-6:00pm, Mon-Fri. \$21.25/hour. Applicants should submit two (2) copies of resume in response to: Case#19981582, PO Box 8968, Boston, MA 02114.

Programmer/Analyst (Burlington MA) Design and develop front end and database applications using Oracle, MS-Access, Crystal Reports and Visual Basic for the retail and automobile industry, most transactions involving the procurement and manufacturing cycles. Develop customized EDI transactions using Unedifact and ANSI standards. Prepare test scripts, test data and perform systems integration and prepare user documentation. Implement and support the application in production. Req'd Bachelors or equiv in Comp Sci. or Eng 2 yr exp in job offd. 40 hr/wk, 8-5p, \$60,000/yr. Submit 2 copies of resume to Case No. 19990057 PO Box 8968, Boston, MA 02114.

Systems Administrator, Malden, MA: Install, configure, maintain and troubleshoot Unix operating systems, Network, NFS, NIS, DNS & RAID systems. Install, configure & maintain LSF and SAS software. Program in Assembly, Perl & Bourne shell. Upgrade system Hardware. Provide technical support. Req'd. Masters* in Engg. or Comp. Scie. or Math. 1* yr exp in job offered. *Will accept Bachelors degree & 5 yrs experience in lieu of Masters & 1 yr exp. 40 hrs/wk., 9a-6p., Mon-Fri., \$89,668/Per Year. Applicants should submit two (2) copies of resume in response to Case #19990364, P.O. Box 8968, Boston, MA 02114.

Information Technology Management Consultants seek to fill a position of Sr. Manager. Qualified applicant should have a B.S. or equiv. in a Computer Sc. or Engineering discipline. Should have 3 yrs. relevant SAP & eBusiness exp. Will manage eBusiness & SAP solutions, Knowledge Productivity Management, development of Strategic System Plans, Enterprise Resource planning, lead the Global Maintenance & Service Industry group, participate in marketing activities, establish & implement company goals, policies & procedures. Manage, supervise & train SAP implementation teams, interview & evaluate qualifications of potential consultants. Send resume to Managing Director, Magnus Management Consultants USA, Inc., 3340 Peachtree Rd., NE, #2310, Atlanta, GA 30326

Manager Marine Systems Development. All duties of Manager Marine Systems Development. Position is located in Miami, FL. Responsible for company's safety and quality management program in accordance with International Safety Management (ISM), SVP, and ISO 9002 regulations. Responsible for the development, design and implementation of various quality assurance programs. Responsible for marine operations administration and daily management. Requirements: B.S., or foreign degree equivalent in Computer Science and Computer Engineering; 2 yrs exp. in the job offered or 2 yrs. exp. as Systems Manager Operations Controller; 40 hrs per week; 9:00am-6:00pm; \$100,000.00 per year. Send resume to Dept. of Labor/Bureau of Workforce Program Support P.O. Box 10869, Tallahassee, FL 32302-0869. RE: JO#FL-2058484.

Computer Services Co in North Brunswick, NJ seeks to fill the following positions:

1) Database Administrators (multiple positions)-Must have Bach Degree in any field & 1 yr exp coordinating physical changes to databases on UNIX & NT platforms; coding, testing & implementing databases; dsgng logical & physical databases; establishing physical database parameters.

2) Software Engineer-Must have Masters in Comp Sci, Comp Engg or Elec Engg & 1 yr exp analyzing, dsgng & dvlpg relational database mgmt systems using ORACLE, C & PL/SOL in UNIX & Win envrmt.

Respond to: HR Dept, Vertex Soft Inc., 63 Sassafra Court, North Brunswick, NJ 08902.

Software Engineers (Multiple Openings) sought by Software & IT Consulting Co. in New Brunswick, NJ. Must have Bachelors w/any Technical/Business related major and 2 yrs exp dsgng apps using any of the following:

- i) VB, SOL Server
- ii) Java/HTML, Oracle
- iii) Unix/NT Systems Administrator
- iv) Oracle, PL/SOL
- v) C++/Unix/Oracle
- vi) Web Developer/ASP/Perl
- vii) SOL Server DBA
- viii) Oracle DBA
- ix) PowerBuilder/SOL/Oracle
- x) Informix 4GL

Respond to: HR Dept, Universal Software Solutions, Inc., 92 Bayard St, New Brunswick, NJ 08901.

INFORMATION SYSTEMS OPPORTUNITIES

Since 1996, HealthStar Network has proven itself a successful and progressive leader in quality, cost effective managed care. As part of this dedication to excellence, we are affiliated with several renowned hospitals in the New York area including Northern Westchester Hospital Center, White Plains Hospital Center, Lawrence Hospital, and Phelps Memorial Hospital Center. To help us attain the goals we've set for the new century, we're seeking to enhance our staff with the following professionals.

SYSTEMS ENGINEER

We seek a candidate with a strong technical background for technical design, implementation, administration and support for AS400 and NT environment. Must have 5-7 years of related experience, a strong background in NT Server 4.0, AS400 and Unix, and demonstrated strong interpersonal and customer focus skills. BS degree also required. Knowledge of Sybase, Citrix, AIX, system performance, system management and capacity planning will be a strong plus.

NETWORK ENGINEER

The qualified candidate will be responsible for technical network design, implementation and support for LAN/WAN environment. Must have 5-7 years of related experience, a strong background in routers, switches, cabling systems, TCP/IP and carrier services. BS degree and demonstrated strong interpersonal and customer focus skills required. Knowledge of Openview Citrix, tariff knowledge, network performance and capacity planning will be a strong plus.

SYSTEMS SUPPORT MANAGER/ ASSISTANT DIRECTOR

Individual must have a Bachelor's degree and 5+ years experience in hospital information on financial and billing systems, HBC or SMS - Project Management experience. We will train for this position.

SYSTEMS ANALYST (RN Background a plus)

Qualifications include in depth knowledge of hospital business or clinical application. Perfect opportunity for an RN willing to change careers into systems applications. We will train for this position.

HealthStar Network offers an exceptional compensation package that you would expect from an industry leader. For consideration, please send/e-mail your resume indicating position of interest and salary history to: **Michael Pagliaro, Senior Vice President/Human Resources, White Plains Hospital Center, Davis Avenue at East Post Road, White Plains, NY 10601; E-mail: mpagliaro@healthstar.org** Equal Opportunity Employer M/F.

HEALTHSTAR NETWORK

SOFTWARE ENGINEER: Using Oracle tool set Oracle Developer 2000, SOL*Forms, SOL*Report writer, SOL*Plus, PL/SOL and in developing procedures, functions and database triggers using PL/SOL for server-end processing. Using the SOL base 5.2, SOL Windows 5.0, Report Windows 2.1, SOL Talk 3.2. Developing applications using Data General's Dg/Mv 15000, Dg-Cobol, Dg/Rdbms, Embedded SOL, Acs/Vs, Power house present. Using the VAX Rdb, Decforms, Embedded SOL, VAX3400, VMS and Acms. Job duties are Analysis of current procedures and problems to refine and convert the data to programmable form; determine output requirements; study existing systems to evaluate effectiveness; upgrade systems presently in use; correct systems/programs as necessary. Requires Masters in Computers with no experience required. 40 hours per week at \$ 75,000 per year. Please send resume to Case # 19990772, PO Box # 8968, Boston, MA 02114.

SOFTWARE ENGINEER

Software Engineer to design, develop and test computer software for business and scientific applications, applying principles and techniques of computer science, engineering and mathematical analysis; analyze software requirements for feasibility of design and hardware interface; design and direct software system testing procedures; and use expertise in Baan ERP software, Baan Dynamic Enterprise Modeling tools for Product Data Management and Enterprise Resource Planning applications. Requirements: Masters Degree in computers, engineering, industrial management, business or related field and three years experience as a software engineer or computer programmer. Knowledge of Baan software and tools. Salary: \$75,000/yr. Working Conditions: 8:00 a.m. to 5:00 p.m., 40 hours/week. Apply: Ms. Margaret Weckerly, Acting Manager, Butler County Job Center, 227 West Cunningham Street, Butler, PA 16003. Refer to Job Order Number WEB 87768.

Software Engineer

Design, Development, Testing and Implementation of commercial/ business application systems. Must have demonstrated ability in design and development of application using Oracle 7.0/6.0, RDBMS/SOL and Oracle tools; demonstrated ability using Pro*C for designing Oracle access modules; and demonstrated ability working on Unix operating systems. Req 2 yrs exp in job offered or 2 yrs exp as a Software Developer. BS in Engg., Computer Sci., Math or related field. Salary: \$55,000/yr. 40 hrs/wk, 8:00 to 5:00 p.m. Send two copies of resume to Job Order # 19990493, P. O. Box #8968, Boston, MA 02114.

DATABASE ADMINISTRATORS (3 positions) to provide systems and database admin on Sybase; perform physical database design, capacity planning, table space management, query optimization, schedule activities, monitor database storage space, administer security and tune database for optimal performance; develop applications with VB and PowerBuilder as front end on Windows NT and HP9000 machines; provide on-site training in Sybase and database admin. Require: M.S. in Comp.Sci, Comp App. or Engg. (any branch). Salary: \$65,000 per year, full time. Resumes to: HR, Software Technical Services, 105 Nobel Court, Alpharetta, GA 30005



St. Jude Children's Research Hospital, located in Memphis, Tennessee, is an internationally renowned healthcare institution which combines scientific research and leading edge technology to provide cures for children with catastrophic childhood diseases.

We have recently embarked on an exciting and ambitious series of projects to deploy advanced clinical and research systems to support our patient care and research activities. Our vision is to implement a "paperless" medical records system by the year 2002. New networks, infrastructure, databases and client server tools have opened up exciting opportunities for highly skilled project staff and managers who would like to join our rapidly growing IT Division. As a member of our IT Services team, you will be challenged to work closely with directors, managers and customers throughout the institution as we re-engineer our business, patient care and research operations. Positions are available in the following areas:

- **Technical Project Manager (Job Code: ITC-4730)** 6 yrs. exp. in systems, networks or operations mgmt. experience req.
- **Disaster Recovery Coordinator (Job Code: ITC-3934)** 3 yrs. exp. in disaster recovery planning/coordination.
- **Re-Engineering Analyst (Job Code: ITC-2892)** 5 yrs. progressive exp. in TQM, Business Process Redesign, IT.
- **Sr. Business Analyst (Job Code: ITC-2894)** 3 yrs. exp. with imaging system implementations/workflow processes.
- **Sr. Clinical Analyst (Job Code: ITC-4726)** 3 yrs. exp. in clinically related specialty, 2 yrs. in information systems.
- **Clinical Analyst (Job Code: ITC-4731)** 3 yrs. exp. in clinical related specialty.
- **Database Programmer (Job Code: ITC-2583)** Oracle, PL/SQL, Unix
- **Software and Web Engineer (Job Code: ITC-2582)** Perl, Java, JavaScript, Unix
- **Software and Systems Analyst (Job Code: ITC-2144)** BSCS, C, C++, Java

St. Jude is located in Memphis, Tennessee, a city rich in history and culture stretching from the banks of the mighty Mississippi to the rolling green hills of eastern Shelby county. Memphis has something to offer everyone whether it's the dazzling night life along legendary Beale Street, the cultured theaters and museums, breathtaking nature preserves, or walks through historic, picturesque Midtown. Memphis also hosts over 150 festivals and special events each year in addition to many major sporting events. So whatever your interest, Memphis can offer you a world of possibilities!

St. Jude offers professional growth opportunities, competitive salaries and a comprehensive benefits package. A full description of these positions can be seen on our web site. For immediate consideration, please e-mail or send hard copy (INCLUDING JOB CODE) to: St. Jude Children's Research Hospital, HR Dept., 332 N. Lauderdale, Memphis, TN 38105. Fax: 901-495-3123. E-mail: lisa.martin@stjude.org



www.stjude.org

An equal opportunity employer, SJCRH screens candidates for a drug-free work environment.

Manhattan Associates, Inc., a worldwide leader in supply chain synchronization systems is looking for analysts and developers to join our team at our Atlanta area headquarters. \$50K and up. Current openings include:

PKMS Implementation Specialists. Use knowledge of management practices to coordinate client projects & interact with all levels of client org. to implement & optimize PKMS supply chain software on mult. platforms. Advise & design sys test plans. Facilitate development of proposals & supports for sales presentations. Req. MS in comp. sci, engg, or related tech. field or management field.

PKMS Implementation Consultants. Coordinate client projects & interact with client org. Evaluate client bus. operations & sys environments to implement client proprietary software sys. Advise & design sys test plans. Assist in development of test & production environ. at client sites. Assist in develop. of proposals & supports for sales presentations. BS in comp. sci, engg, or related tech. field. Substantial travel req.

Software Developers. Assist in defining sys scope & requirements, analyze use of existing sys requirements, & design & develop sys in light of future directions in hardware & software growth. Develop & direct design of software sys. MS in comp. sci, engg, or related tech. field. Technical knowledge of: RPG/400, or C++ & CORBA on a Unix or NT platform with an Oracle database utilizing class design & class implementation, or MicroFocus Cobol on a Unix platform with an Oracle database demonstrated through edu. or exp.

Software Analysts. Design, develop, code, test & debug software applications. Req. BS in comp. sci, engg, or related tech. field. Exp. to include 6mths using RPG/400 or C++.

Database Administrator. Database implementation and support to users on database applications across platforms utilizing knowledge of Unix and Shell programming as well as SQL, PL/SQL. Req. MS in comp. sci, engg, or related tech. field

Senior Software Engineers. Develop & direct software programming, documentation & sys testing procedures for software program applications. Req. MS in technical field (comp. sci, IT, math, engineering, physics, etc) & 3 yrs exp as a developer or tech leader or a BS in a technical field & 5 yrs exp as a developer or tech leader. Exp. to include at least 6 mths with full life cycle development using C++ or RPG/400.

Resumes to: J. Lurey, Manhattan Associates, 2300 Windy Ridge Pkwy, 7th Fl. North, Atlanta, Georgia 30339

Software Engineer. Conduct independent research and development in the area of telecommunication network management and service provisioning process, including protocol design and system implementation. Responsibilities include refinement of the definition of the application domain, collection and evaluation of domain knowledge, implementation and testing of the network object model and system programming, maintenance and support of the running system in operation. Act as a key member of the Distributed Object Management and Activation for Integrated Networks (DOMAIN) project. This extremely complex system requires management of distributed information and large scale software implementation involving databases, object oriented design/analysis/programming, CORBA, Internet and World Wide Web (WWW) technologies. Responsibilities include 1) designing and implementing a framework for distributed application development 2) formulating and implementing an intelligent engine for telephone number retrieval and allocation during service provisioning 3) conforming existing application code to ANSI C++ standards. Requires MS in CS plus 1 year experience in Object Oriented Programming and Distributed Computing in a university, national or private sector laboratory. Experience must include 1) research and hands-on experience in object oriented and distributed computing technologies to be able to develop such a large scale system 2) knowledge of C++, Java, Generic software libraries (Standard Template Library) and CORBA 3) thorough understanding of internet technology like WWW, CGI, and HTML. \$75,000/yr, 40 hrs/wk, 8-4:30pm. Send 2 resumes to Case# 19983140, PQ Box 8968, Boston MA 02114.

SOFTWARE ENGINEER: Data modeling using CASE tools like ERWIN, TURBOANALYST to do structured system analysis and design of complex relational databases, that is, to produce Entity Relationship Diagrams (ERD), Data Flow Diagrams (DFD) and Functional Decomposition diagrams. Using ORACLE development tools like ORACLE FORMS 4.5, ORACLE REPORTS 2.5, Developer/2000, SQL*FORMS, SQL and SQL*PLUS, EMBEDDED SQL in PROCOBOL and PL/SQL. Developing STORED PROCEDURES, FUNCTIONS AND DATABASE TRIGGERS using PL/SQL for server end processing. Job duties are Analysis of current procedures and problems to refine and convert the data to programmable form; determine output requirements; study existing systems to evaluate effectiveness; upgrade systems presently in use; develop, test and implement new software; observe functioning of newly implemented systems and programs for trouble areas; correct systems/programs as necessary. Requires Masters in Computers (or) Sciences with no experience required.. 40 hours per week at \$ 72,000 per year. Please send resume to Case # 19990908, PQ Box # 8968, Boston, MA 02114.

MJ Technologies of NJ, Inc. is seeking experienced professionals with the following skills:

- Real Time Embedded, pSQS+, VxWorks, QSE, ISDN, ATM, SQNET, VoIP/VoATM, SNMP.
- HTML, Corba, Perl, CGI, RMI, IIS, MTS, KIVA.
- Oracle, Sybase, Corba, VC++, MFC with CQM/DCQM, SQL, VB, ActiveX, PB, C, C++ on Unix/NT.
- HP-UX, Sun Solaris, Linux, AIX, Networking, Win-NT, DB2, UDB, Oracle, Sybase, Informix, SQL Server Administrators.
- Datawarehousing and ERP having ORACLE Financials, PeopleSoft, CRM, Baan.

We provide a very competitive salary and benefits package and is an EOE.

Please respond to: HR Dept., MJ Technologies of NJ, Inc 762 Green St., Ste 2C, Iselin, NJ 08830 Tel: (732)855-1194 Fax: (732)855-7911 Email: hrdept@mjtjnj.com

SENIOR SOFTWARE ENGINEER to provide on-site consultancy in object oriented design and analysis for various software systems to allow visualization and monitoring of movable machinery using wireless communications protocols (WAP) and heterogeneous network operating systems; provide related architecture, database design and integration; design, write and test server-side Microsoft CQM objects on Windows NT using Microsoft 11S, Unified Modeling Language (UML) with Rational Rose, Microsoft J++, XML/XSL, Microsoft CQM/MTS architecture, HTML, Visual SourceSafe, Microsoft SQL Server, Authentication and Authorization, Site Server eCommerce Pipeline, Centralized Logging and Alerting System (CLAS), Microsoft Data Transformation Services (DTS) and SQL Stored Procedures. Require: M.S. (or equivalent) in Computer Science/Electrical Engineering and two years experience in the job offered or any experience providing skills in described duties. 40% travel to client sites within the United States required. Salary: \$69,000 per year, 8 am to 5 pm, M-F. Apply with resume to: H.R. Manager, 4C Solutions, Inc. 4601 Six Forks Road, Suite 500, Raleigh NC 27609

SOFTWARE ENGINEER: Proven ability in using SQL Windows and Power Builder to design and develop client server applications using the object oriented technology. Ability in using Microsoft Visual Basic to design and develop client server applications using the CQM architecture, ActiveX technology and Microsoft Universal Data Access methods. Experience in developing queries, stored procedures, database triggers and fine tuning of SQL using Gupta SQL Base on Novell NetWare, Sybase SQL Server's Transact-SQL and Oracle's PL/SQL on HP UNIX. Working knowledge in using Erwin Database designer and easy case tool to produce Entity relationship diagrams(ERD), Data flow diagrams (DFD) and functional Hierarchy diagram. Job duties are Analysis of current procedures and problems to refine and convert the data to programmable form; determine output requirements; study existing systems to evaluate effectiveness; upgrade systems presently in use; develop, test and implement new software; correct systems/ programs as necessary. Requires Bachelors in Engineering with 2 yrs of software development experience. 40 hours per week at \$ 70,000 per year. Please send resume to Case # 19990800, PQ Box # 8968, Boston, MA 02114.

Adil Business Systems Inc, a NY IT Co, is looking to fill the following positions at their work sites at NY, NY:

Programmer Analyst-Bach deg in engg (any), math, science +2 yrs exp in job (or) 5 yrs exp in job. Must have exp in MS-ACCESS, MS-EXCEL, Win NT, ORACLE, C, UNIX.

Programmer Analyst-Bach deg in engg (any), math, science + 2 yrs exp in job (or) 5 yrs exp in job. Must have exp in Visual C++, SDK, Win NT, Visual Basic.

Network Analyst/Engineer-Bach deg (any field) + 2 yrs exp in job offd. Must have exp setting up NT servers, Win NT n/work, Win NT Server, workstations, Win 98/ n/work printers & switches, & Microsoft Office.

Software Engineers: Must have exp in using UNIX, C/C++, Masters in Elect/ Comm, Eng, Comp Sci, w/2 yrs exp (or) Bach w/5 yrs exp/dsgn & dvp, various s/ware applics using Unix, C, C++, Sybase & CASE tools.

Send resumes to Adil Business Systems, Inc. 75 Willets Dr, Syosset, NY 11791.

Translator. Perform tech'l writing & translation of adv'd banking software documentation from Eng to Greek, French & Italian under win 95/nt, adobe framemakr, acrobat, robohelp, winhelp, html, power pt, resource wkshp, coreldraw, thumbs+, word, access, amipro, excel, outlook, scheduler+, lotus 1-2-3, intrnet & intrnet db mining environ; prep layouts of instructional manuals & materials for software sys, compile prgrmr & testers' notes into software release notes, recom'd & implem't tech'l translation staff policies, procedures & writing style; create new graphic & CD covr designs & on-line scrn icons & appropriate instruction keys; intervw, train, provide & present corp image guidelines in multi-lang sales seminars to tech writers & int'l clients; create on-line tech document'n & co's news flash for intrnet distrib & pub; dev document'n in multi-media formats, prints, & electronic formats; coord printing, binding & production of software prod's & pub of docs re thereto. 40hrs/wk, 8a-5p, M-F, BA Lang Interpretation & Translation, 2yrs exp in job offered, must write, read & spk Eng, Grk, Fr & Ital, \$36,596/yr. Resume to JOFL2058199, Dept. of Labor/Bureau of Workforce Progm Support, PQ Box 10869, Tallahassee, FL 32302

SOFTWARE ENGINEER. ORACLE Designer/2000 to produce Entity Relation Diagram (ERD), Data Flow Diagram (DFD), data Diagrammer (DD) and Functional Hierarchy diagrams. Also should have sufficient knowledge about Reverse Engineering. ORACLE Database Administrator to perform various databases administrative work in 2-tier and 3-tier client server environment. Should have sufficient knowledge regarding oracle enterprise manager, platinum DBA. Installing/maintaining Peoplesoft databases in 2-tier and 3-tier architecture. Sufficient knowledge regarding Tuxedo and Redpepper m/c is required. Job duties are Analysis of current procedures and problems to refine and convert the data to programmable form; determine output requirements; study existing systems to evaluate effectiveness; upgrade systems presently in use; develop, test and implement new software; correct systems/programs as necessary. Requires Masters in Math (or), Physics (or), Chemistry (or), Computers with no experience required. 40 hours per week at \$ 72,000 per year. Please send resume to Case # 19983618, PQ Box # 8968, Boston, MA 02114.

Senior Software Engineer - Aid in the development of a worldwide showcasable information warehouse. Perform client/server applications development which utilizes web based user interfaces. Responsible for the logical and physical design of Oracle databases; define, design and code SQL stored procedures and packages used to manipulate data from source transaction systems. Design and code extract and load procedures using SQL Loader and PL/SQL; design and code large scale client/server application systems. Requirements include a Master of Science Degree or foreign equivalent in Computer Science or Computer Engineering or Industrial Engineering with at least two years of experience in job offered or related field of software engineer. Knowledge of: C, UNIX, Shell Scripts, Oracle, PL/SQL, SQL Loader, Stored Procedures, Database Design Methodologies/Architectures, Web based Technologies and Client/Server Applications. Applicants must have unrestricted authorization to work in the United States. Salary \$73,008/year. 40 hours/wk. Respond with two copies of resume to Case #19990178, P.Q. Box 8968, Boston, MA 02114

SOFTWARE ENGINEER: Proven ability in using Oracle Tools Oracle Developer (Forms, Reports and Graphics), Oracle Case Tools, Oracle Designer, SQLPLUS, PL/SQL and SQL Loader. Proven ability in using Oracle Pre compilers (Pro*C), User Exits, Foreign function interface (ORA FFI) and Oracle Call Interface (OCI). Demonstrated ability in designing applications, user interfaces, developing store packages, procedures, functions and database triggers. Proven ability in fine-tuning and optimization of SQL and PL/SQL program units for server end processing. Job duties are Analysis of current procedures and problems to refine and convert the data to programmable form; determine output requirements; study existing systems to evaluate effectiveness; upgrade systems presently in use; develop, test and implement new software; correct systems/programs as necessary. Requires Masters in Computers with no experience required. 40 hours per week at \$ 76,000 per year. Please send resume to Case # 19990936, PO Box # 8968, Boston, MA 02114.

SOFTWARE ENGINEERS (6 positions): require Bachelor's in Engineering/Computer Science/Mathematics/Science or closely related field with two years experience providing skills in described duties, at \$65,000 per year; Senior Software Engineers (4 positions) with Master's and two years experience, at \$70,000 per year. Provide on-site consulting in design, analysis and development of software applications for legacy systems in IBM mainframe environment; development and administration in Oracle, DB2, SQL Server and Sybase; e-commerce and web applications development in Microsoft, Java and related technologies; network management systems development with Netscape Server and related tools; SAP R/3 applications on Windows with DQS and ABAP/4 and related modules. 40% travel to client sites in the United States. Mail resumes to: YASH Technologies, Inc., 2100 Parklake Drive, NE, Suite F, Atlanta, GA 30345-2167

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Data Base Administrator

wanted by New Jersey based S/ware Dvlpt Firm for job loc throughout the US. Must have Masters in Comp Sci, Math or Engg (any field) & 2 yrs s/ware exp.

Respond to: HR Dept, Laxmi Consulting Services Inc., 200 Essex Turnpike, Ste 201, Iselin, NJ 08830.

Programmer Analyst/Internet Software Developer wanted by Internet Network Firm in Purchase, NY. Must have Bachelor in Computer Science/ Electrical Engineering plus 2 years experience planning, developing, testing and documenting Internet and network related programs. Database development experience w/INFORMIX in UNIX environment and shell scripts, C, C++ and SQL languages required. Send resume only to UUNET Technologies Inc. c/o C.Growthowski, 100 Manhattanville Rd., Purchase, NY, 10577.

SOFTWARE DEVELOPER: Design, Development, Testing and Implementation of commercial/business application systems on a Unix platform; Demonstrated ability using Powerbuilder 5.0/4.0 and Class Library; Demonstrated ability using Oracle 7.0 RDBMS and PL/SQL; Demonstrated ability working on Windows NT. Requires: B.S. or equivalent in Comp-Sci, Math, Engg or related field plus 2 years experience in job offered or software development; 40 hrs/wk, 8:00 a.m. to 5:00 p.m.; \$60,000/yr. Send two (2) copies of resume/respond to: Case #19983813, PO Box 8968, Boston, MA 02114.

Systems Administrator

wanted by S/ware Dvlpt Firm in New York, NY. Must have MS in Inform Systems, Comp Sci, Electr Eng'g or Math & 1 yr exp supporting & maintaining internal network system & network infrastructure.

Respond to: HR Dept, Imagine Software, Inc., 400 Madison Ave, 21st Fl, New York, NY 10017.

Systems Analysts wanted by Cellular Co. in Manh: Experienced in Dsgn, dvlp, implement, sophisticated software and database systems for wireless business; Test, maintain systems, perform trouble shooting & train end users; Use C, Visual Basic & Sybase. Req. Bach. w/2yrs exp.

Send resume to Dynamic Cellular, 355 East 86th Street, New York, NY 10028.

SR. SOFTWARE CONSULTANT System integration of multiple customer platforms to support company's EDI/E-Commerce products. Bachelor's Computer Science + 5 years exp IT consulting. Proficiency w/ NT, UNIX, AS/400, Novell, Oracle, Microsoft SQL Server, Ingress, DB/2, LAN/WAN, Communication, Microsoft Backoffice Products (IIS, Proxy Server, Exchange Server) EDI, E-Commerce, SAP (ERP Package). \$80,000/yr. 8:30am-5:30pm, M-F. Send resume to: Lisa Phillips, Recruitment Mgr, Harbinger Corp, 1277 Lenox Park Blvd, Atlanta, GA 30319, REF#KKT

Multiple openings for Programmer Analysts, Project Leaders and Sr.Consultants. Must have BS/MS(CS) or equiv. and exp. in one or more of following: VC++, COM/DCOM, MFC, ASP, ATL, IIS, MTS, ADO, JAVA, HTML/DHTML, CORBA, EJB, NETDYNAMICS, ERP/SAP, NETWORKING, LOTUS NOTES ADMINISTRATORS, WEB TESTERS. Send resumes to: e.Solve technologies, 165 Washington Street, Quincy, MA 02169. OR jobs@esolve-tech.com

Software Engineer wanted by Comp Services Co in Holmdel, NJ. Must have Masters in Comp Sci, Comp Engg or Info Systems & 6 mos exp analyzing, dsgng & dvlpg comp s/ware using Visual Basic, Visual C++, Crystal Reports, SQL, SQL Server anywhere, MS Access & other relational database tools. Respond to: HR Dept, Integrated Solutions, Inc., 2124 Highway 35, Holmdel, NJ 07733

Principal Software Engineer sought by Co providing E-Solutions - Integrated Web Systems in Concord, MA. Must have BS in Math or Comp Sci & 5 yrs exp in s/ware engg including C++ experience.

Respond to: HR Dept, Kanda Software, Inc., 358 Baker Ave, Concord, MA 01742.

IT Principle III Applications Developer (Engineer) wanted by Co involved in mfg, sales & services of HVAC equipment worldwide in Clarksville, TN. Must have Bach of Comp Engg or Engg. Knowledge of software development and engg; and CAD expertise reqd. Respond to: HR Dept, The Trane Company, 2701 Wilma Rudolph Blvd, Clarksville, TN 37040.

Sipex Corporation, headquartered in Billerica, Massachusetts, seeks a Systems Administrator to direct project teams in the deployment of PROMIS software. Duties include performing system upgrades and new revisions. Requires a Bachelor's degree or equivalent in an engineering or technological discipline and industry experience. If interested and qualified, forward resume to: Human Resources, Sipex Corporation, 22 Linnell Circle, Billerica, MA 01821.

Software Engineers (2 positions) manage teams to analyze, design, develop, test and implement applications using VB, Power Builder, CYRSTAL Reports, Oracle, SQL Server and Informix on UNIX and Windows; lead projects to develop interactive web sites using Java, VB Script, Java Script, HTML and ASP. Require: MS with Conc in CS or Engg (any branch) with 3 yrs exp. in the IT field. A BS or equiv. in any of the above with 5 yrs of progressive relevant exp will also be accepted. Salary \$66K/yr, full time. 60% travel. Resumes to: Smartsoft International, Inc., 5815 Live Oak Pkwy, Suite 2H, Norcross, GA 30093.

Vice President of Finance & Administration (Accountant) wanted by Internet Media Co in New York, NY. Must have Bach of Commerce in Accounting & 6 yrs accounting exp.

Respond to: HR Dept, c/o Ammar Afif, Yack, 461 Fifth Ave, 12th Fl, NY, NY 10017.

Programmer/Analyst: using Visual C/C++, Direct Draw, COM/DCOM on Windows platform to design, implement & maintain 2D/3D graphical firearms training software system. Req. MS or equivalent in CS or MIS; Proficiency in Visual C++, COM/DCOM and Windows NT/98. \$62,400.00/yr., 40hr/wk, 8:00 a.m.-5:00 p.m. Contact Mike Kim at Technical Resource Group, Inc., 1040 Crown Pointe Pkwy., Ste 500, Atlanta, GA 30338 mkim@dreamjob.com.

Engineer, Software Quality wanted by S/ware/News Aggregation Firm in Burlington, MA. Must have Bach in Comp Sci or related field.

Respond to: HR Dept, NewsEdge Corporation, 80 Blanchard Rd, Burlington, MA 01803.

Network Administrator Systems Analyst wanted by Mfr of Fuel/Pump Dispensers in Greensboro, NC. Must have Bach in Comp Sci or equivalent or BS thru edu/experience & 2 yrs network exp, two yrs exp in multidomain NT environment and MCSE certification required.

Respond to: HR Dept, Marconi Corporation, 7300 West Friendly Ave, Greensboro, NC 27420-2087.

Software Engineer

wanted by Software Dvlpt Co in Boston, MA. Must have Bach in Engg, Comp Sci or related field & 5 yrs s/ware exp.

Respond to: HR Dept, Redwood Investment Systems, Inc., 76 Summer St, Boston, MA 02110-1225.

Software Engineer

wanted by New York based Comp S/ware Dvlpt Firm for job loc in New York Metropolitan area. Must have Bach in Comp Sci, Engg or Math & 2 yrs exp researching, dsgng, dvlpg, testing & implementing comp systems s/ware using C++.

Respond to: HR Dept, L & A Inc., 264 Forest Ave, Rye NY 10580.

Database Administrator

wanted by financial services firm in New York, NY. Must have BS in Electronics & Communications Engg or Comp Sci or Math & 2 yrs exp providing production support for several Oracle databases in a dynamic HP-UNIX and NT envrmt. Backup & recovery, performance tuning, RMAN, OEM, space mgmt, strong SQL, logical/physical database design.

Respond to: MIS-Director of Systems, Nathan & Lewis Securities, Inc., 260 Madison Ave, New York, NY 10016.

Programmer-Web Designer

wanted by Branding & Communications Co in New York, NY. Must have 2 yrs exp converting data from project specifications to create websites & online annual reports using HTML, DHTML, Java Script, Perl, ASP, SSI & SQL, Comp Languages.

Mail resume to: HR Dept, Addison Design Co, 79 5th Ave, New York, NY 10003.

Software Consultant (Concord, CA) Interface EC products w/ clients' applications, create/deliver EDI presentations/product demos, work w/ multi-business partners to design/build/support EC solutions. BSc Computer Sci or Eng, 5 yrs exp Project Mgr, Softw Eng or Softw Consult, knowldg of Unix, NT, Sybase, Oracle, Informix, EDI, C++, Perl, ShellScript, CGI, Java & exp w/ TLE & EDI, open/templar apps, BAAN, Oracle, Peoplesoft & SAP. \$73,923.20/yr, 40 hrs/wk, OT as needed. Send resume to: S. Stevenson, 750 Commerce Dr, #100, Decatur, GA 30030.

SR. SOFTWARE CONSULTANT (ATLANTA, GA) Interface EC products w/ clients' applications, create/deliver EDI presentations/product demos, work w/ multi-business partners to design/build/support EC solutions. MS Engineering, Computer Sci, Technology, 2 yrs exp Programmer/Analyst, exp w/ systems admin, Solaris, IRIX, HP-Aux, Windows NT/95, knowldg of SAP, ABAP/4, EDI, ALE, SOL, Unix scripting languages, RFC, BAPI's, product testing, quality control procedures, networking. \$70K/yr, 40 hrs/wk, OT as needed. Send resume to: K. Thompson, 750 Commerce Dr, #100, Decatur, GA 30030.

Programmer Analyst wanted by Co involved in mfg & distribution of chemicals, plastics in Trenton, NJ. Must have Bach in Comp Sci or Comp Engg & 2 yrs exp analyzing & evaluating existing or proposed systems, devise comp programs, systems & related procedures to process data using Developer 2000, Oracle 7.x, PL/SOL, C & C++.

Respond to: Sam Pittam, Hutchinson Industries Inc., 460 Southard St, Trenton, NJ 08638 Fax 609-394-2031, email: spittam@hutchinsoninc.com

Development

**Sr. Software Engineers
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Controls Engineers
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Quality Engineers
RF Engineer
Technical Support Specialists
Tools Engineer
Training Engineers
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**Business Applications Developer
System Administrators
UNIX Systems Administrators**

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**Communications Segment Manager
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Web Developers**

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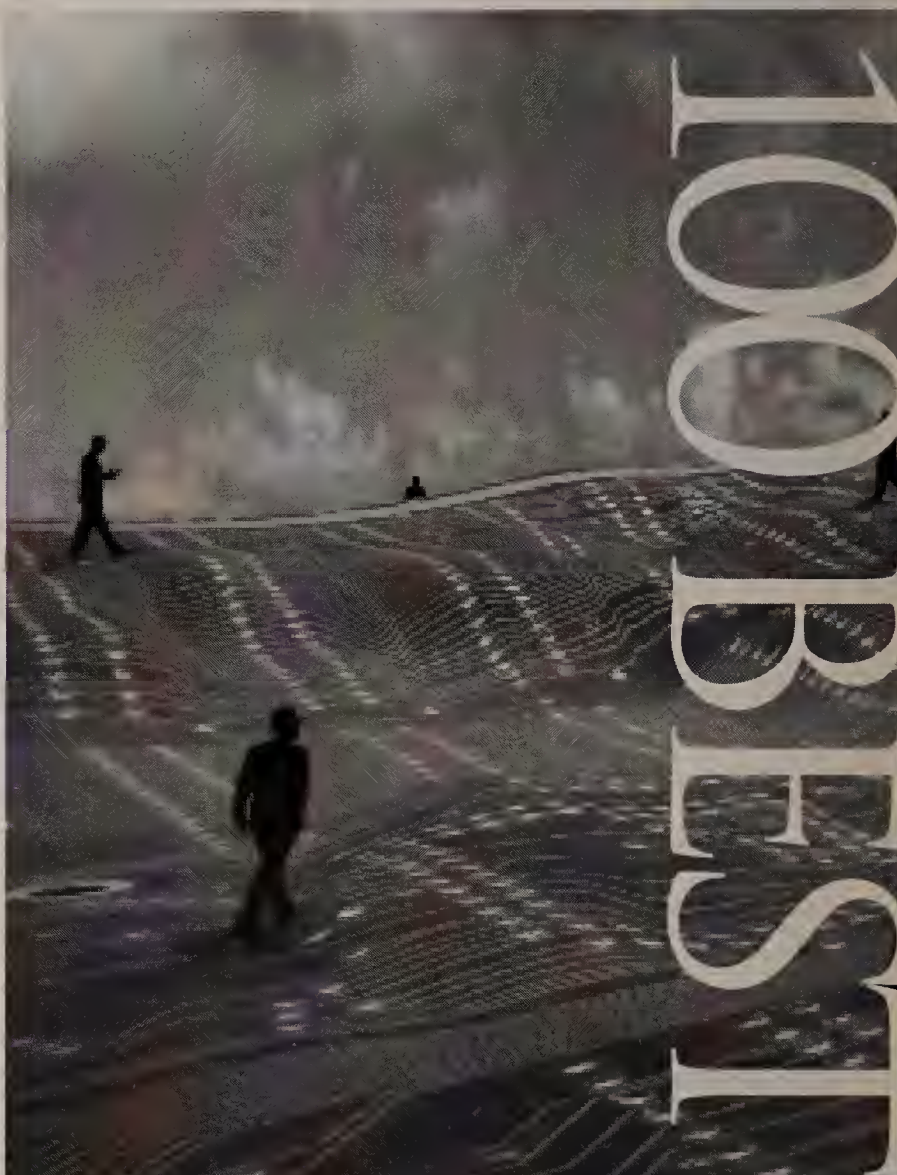
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IT Careers in Healthcare

by Carole Hedden

It's called the e-healthcare space – the combination of healthcare and patient wellness with e-commerce. There are plenty of opportunities for applying technology to the industry while also participating in medical discovery, research and development and innovation.

GE Medical Systems Waukesha, WI

Early in the 20th century, X-rays came into being, serving as the foundation for the GE Medical Systems business. Today the \$7 billion developer, manufacturer and distributor of medical imaging technology, patient monitoring systems and information systems to the healthcare industry is more and more often focusing on information technology.

Greg Lucier, vice president and general manager of global services, says the business has three primary areas of IT focus. "We're doing very advanced remote monitoring and diagnostics of imaging equipment," he says. "For example, a customer in Atlanta may have an MRI – we monitor the device to assure its upkeep and to provide upgrades. We also offer training and other services for the users of that piece of equipment – and it's delivered to the customer through information technology."

GE Medical Systems also is helping hospital staffs manage imaging data throughout the facility. "Our customers more and more want to examine the image on a computer screen versus looking at film," explains Lucier. "We also are providing general information technology surrounding patient information and data mining so that our customers can identify better treatment paths."

To meet these customer needs, GE Medical Systems needs people who understand the healthcare industry. Matthew Fairbairn, human resources manager, explains, "We need people who can devise solutions that allow people delivering

healthcare to be far more effective. Engineers, software developers, system integrators and people with web-based experience are needed. During our interviews, we look for people who have a tremendous amount of energy and who can energize others."

Lucier believes there are advantages for working in the e-health space and at GE. "There's a high degree of

certainty that what you do will make a difference and that you'll be given the resources, reach and capability to make great ideas happen," he says. Fairbairn adds that GE couples this prospect with offering a broad array of industries and businesses, providing a diversity of career pursuits. "You may come into GE through GE Medical Systems, but depending on what you want to achieve, you can move to any number of businesses, from power to consumer products – all within the same company. GE offers a very dynamic and exciting environment with tremendous growth opportunities for employees throughout the company."

WellPoint Health Networks, Inc. Thousand Oaks, CA

The healthcare, financial and management areas offer another angle on career opportunities. WellPoint Health Networks, the parent company of Blue Cross of California, is one of the largest healthcare companies in the nation. For the second year in a row, *Forbes Magazine* has named WellPoint as "The Nation's Most Admired Healthcare Company."

Today, the WellPoint group of companies includes UniCare Health Plans, a pharmacy benefit management program and several specialty

divisions, including life insurance, behavioral health and dental programs. "The mission hasn't changed, but we've expanded geographically, and we offer more product choices to employer groups and individuals," says Steve Wesson, manager of technical recruiting.

"We view e-business as a key opportunity for our company," he adds. "We

want to position ourselves to take full advantage of that opportunity." In addition to the traditional business units, the company recently added an e-business division to focus resources and investments on this evolving industry.

Initially, the new role of IT focuses on defining a strategic enterprise architecture. Wesson says this

"There's a high degree of certainty that what you do will make a difference and that you'll be given the resources, reach and capability to make great ideas happen."

*Matthew Fairbairn
Human Resources Manager
GE Medical Systems*

IT Careers in Healthcare

"Our technical capacity and environment are a living, growing entity. We need creative people to come on board who will challenge us to have the best operating system in the industry. This evolving capability will allow us to provide better member services, improved data management and more efficient business operations. As one of the nation's largest health care companies, we are building one of the largest IT systems."

*Steve Wesson
Manager of Technical Recruiting
WellPoint Health Networks, Inc.*

will involve a number of changes in platforms, technologies, and integration opportunities across the business.

Web sites and technologies are being refined to work from a branding and identity perspective while offering new features and services to consumers and businesses using the health plans.

"Our technical capacity and environment are a living, growing entity," he adds. "We need creative people to come on board who will challenge us to have the best operating system in the industry. This evolving capability will allow us to provide better member services, improved data management and more efficient business operations. As one of the nation's largest health care companies, we are building one of the largest IT systems."

WellPoint is looking for people well-versed in e-business development and client/server technologies such as Oracle and DB2, IBM's WebSphere and VisualAge, Java and other technologies. "When searching for IT talent, we first look to see that the candidates' technical skills are aligned with our environment, but secondly and equally as important, we look for candidates with growth, accomplishments and evidence of the ability to work in a team atmosphere," Wesson says.

In return, WellPoint offers associates a dynamic opportunity where the potential for growth and advancement is significant. "We're a very aggressive company, growing about 15 percent per year," according to Wesson. "We rely heavily on information systems and constantly challenge our IT people to come up with new ways and new technologies to support our business." WellPoint IT has also started to place increasing emphasis on training their internal staff for the target environment.

"WellPoint has the type of environment that allows you to interact with the latest technology, where you're compensated well and where you can continue to learn and grow," adds Wesson. "Healthcare is a growth industry. We will be providing products and services to more people than ever before. New medical treatment, advanced equipment and new drug developments will drive the growth of our industry. We must

wrestle with the challenges these advances represent, and we must use technology effectively to manage growth.

White Plains Hospital Center/ HealthStar Network White Plains, NY

In an industry where the mission remains to care for people, information technology is seen as the instigator of change, providing new tools to improve and manage patient care. The HealthStar Network represents an enabling IT force for four New York hospitals.

"We're an affiliation of four hospitals located in this geographic area," explains Michael Pagliaro, senior vice president. Other members of the hospital network include Phelps Hospital in Tarrytown, Northern Westchester Medical Center and Lawrence Hospital in Bronxville.

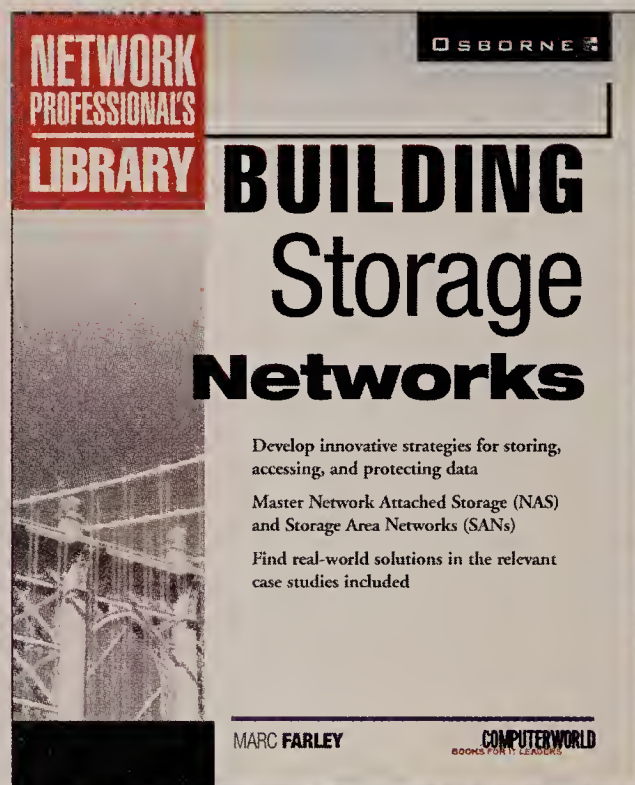
"We recently opened an IT Center that links the four hospitals," says Pagliaro. The new mission is to develop and implement projects that support the health system network. The new system IT provider is forging the four separate IT approaches into a single one, while concurrently developing tools for the hospital communities. In addition, the newly organized HealthStar IT Department will refine and improve web sites for the group and individual hospitals, as well as for the network's Phobia Clinic. Another project to be undertaken is to develop and implement systems serving the network's laboratories.

"We are hiring network people, technical engineers, those with data base expertise, operators, analysts, program developers, integration experts and help-desk personnel," says Pagliaro. "We need people who preferably have a medical background with technical capability."

In addition to the challenges of projects that span the business for a hospital, HealthStar offers ongoing training and education. "We want people to have the opportunity to stretch and grow. Here at HealthStar you'll be in on the ground floor of something all new," adds Pagliaro. "You'll be in a very competitive geographic area where there is tremendous importance given to information technology – yet here you'll have the ability and freedom to work your ideas."

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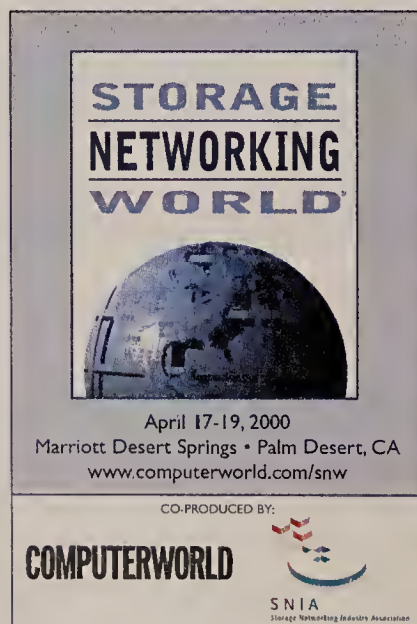
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Advanced Micro Devices (H).....	25.1
Teradyne (H).....	21.3
Soletron Corp. (H).....	20.0
Applied Materials (H).....	19.9
Informix Software Inc.	17.2
National Instruments Corp. (H)....	16.8
Cognos Inc.	16.7
ASM Lithography Holding.....	16.5

DOLLAR

Hewlett-Packard Co.	18.38
Applied Materials (H).....	18.19
ASM Lithography Holding.....	18.03
Teradyne (H).....	17.00
Advanced Micro Devices (H).....	14.88
Lexmark International Group Inc.	13.69
EMC.....	13.63
Adobe Systems Inc.	13.25

LOSERS ↓

PERCENT

Parametric Technology Corp. (L)....	-49.1
Legato Systems Inc.	-48.0
Network Computing Dev (L).....	-41.2
Spyglass Inc.	-23.5
Informatica Corp.	-20.7
Pictoretel.....	-20.0
Documentum.....	-17.8
Microsoft Corp.	-17.6

DOLLAR

Legato Systems Inc.	-20.50
Veritas Software Corp.	-19.31
Informatica Corp.	-19.25
Microsoft Corp.	-18.63
Yahoo Inc.	-17.25
Spyglass Inc.	-16.88
Nextel Communications.....	-13.25
Documentum.....	-12.91

Microsoft Stock Takes Wild Ride

Ruling causes Wall Street jitters, tech stock sell-offs

BY KATHLEEN OHLSON

ANALYSTS EXPECT Microsoft Corp.'s stock to continue to lag as long as the uncertainty of its antitrust case lasts — and perhaps even after the remedy phase is complete.

The stock and the financial markets took a pounding last week even before U.S. District Court Judge Thomas Penfield Jackson ruled Microsoft had violated the Sherman Antitrust Act.

Rumblings started last Monday after Microsoft and the Department of Justice failed at a last-ditch effort to settle.

Microsoft's stock tumbled \$15.88 to \$90.875 per share — more than 14% — and the Nasdaq Stock Market dove 349 points to finish at 4,224 as frantic investors waited for Jackson's ruling.

The drubbing continued Tuesday, as Nasdaq dropped a record 575 points before recovering. Nasdaq rose late in the week, though Microsoft remained below \$90 per share.

Microsoft's stock will be on a roller-coaster, hovering around the \$80s and \$90s as

the market digests the ruling and figures out the long-term effects, says Jeffrey Maxick, an analyst at Chicago-based Madison Securities Inc. "It may gain 25% and reach the 110 area, but shareholders won't do better than that," he says.

Frederic Dickson, an analyst at Branch Cabell & Co. in Richmond, Va., says Wall Street treated Microsoft "very gently" compared with how it sometimes reacts to negative news from other companies. Microsoft suffered a 15% to 20% drop, but others are often hit with a 25% to 40% instant correction, Dickson says.

The remedy phase will be key to Microsoft's long-term stock value, but analysts declined to speculate about what the verdict will bring. Most agreed it would behoove Microsoft and the Justice Department to settle so both sides can move on.

But Maxick says he doubts Microsoft will settle. "It would be in Microsoft's interest to settle, but it's a 1,000-pound gorilla, and it's not in them to compromise."

Microsoft's Stock in Battle

Oct. 20, 1997

DOJ sues Microsoft for violating 1995 consent decree. Stock close: 132 5/8

May 12, 1998

Appeals court rules injunction doesn't apply to Windows 98. Stock close: 82 11/16

Oct. 19, 1998

Trial begins. Stock close: 102 15/16

June 24, 1999

Trial ends. Stock close: 84 5/8

April 3, 2000

Judge rules Microsoft is a monopoly. Stock close: 90 7/8

Nov. 5, 1999

Jackson issues "finding of fact" in case. Stock close: 91 9/16

EXCHN 52-WEEK RANGE APRIL 7 2 PM WK NET CHANGE WK PCT CHANGE

SOFTWARE OFF -2.7%

ASWX	149.12	11.00	Active Software (H)	64.88	-4.88	-7.0
AOBE	123.38	26.43	Adobe Systems Inc.	123.38	13.25	12.0
ARBA	183.34	15.25	Ariba Inc.	101.25	-0.63	-0.6
AZPN	55.37	8.12	Aspen Technology Inc.	40.56	1.44	3.7
ADSK	56.06	17.00	Autodesk Inc.	46.63	3.50	8.1
AVIO	25.58	9.43	Avid Technology	20.31	2.69	15.2
BMCS	86.62	30.00	BMC Software Inc.	49.13	0.75	1.6
BOBJ	150.87	8.18	Business Objects S.A.	97.00	-2.50	-2.5
CON	28.62	9.18	Cedence Design Systems	18.44	-1.13	-5.8
CBTSY	60.87	8.56	CBT Group Plc.	49.13	3.00	6.5
CHKP	295.00	11.50	Checkpoint Software Tech. Ltd.	189.75	11.75	6.6
CTXS	122.31	13.25	Citrix Systems Inc.	74.38	6.31	9.3
COGN	82.25	19.37	Cognos Inc.	73.81	10.56	16.7
CA	79.43	32.87	Computer Associates Int'l Inc.	61.50	2.56	4.3
CPWR	40.00	16.37	Compware Corp.	20.38	-1.31	-6.1
OCTM	106.00	9.37	Docuementum	59.41	-12.91	-17.8
EFII	66.37	35.00	Electronics For Imaging	63.75	7.31	13.0
HNCS	130.00	13.75	Hnc Software	77.50	-1.88	-2.4
HYSL	65.00	9.87	Hyperion Software	32.88	0.63	1.9
IOXC	49.12	12.43	IOX Systems	22.63	-4.13	-15.4
INFA	110.87	8.00	Informatica Corp.	73.75	-19.25	-20.7
IFMX	20.98	6.03	Informix Software Inc.	20.06	2.94	17.2
INTU	90.00	22.50	Intuit	49.69	-1.90	-3.8
JKHY	40.00	13.21	Jack Henry Associates	38.00	2.00	5.6
JOEC	48.31	10.87	J.D. Edwards & Co.	30.06	-2.13	-6.6
LGTO	82.50	15.06	Legato Systems Inc.	22.25	-20.50	-48.0
MACR	100.00	27.37	Macromedia Inc.	80.69	2.19	2.8
MANU	70.25	5.25	Manugistics Group Inc.	44.69	-5.06	-10.2
MENT	18.50	7.75	Mentor Graphics	14.56	-0.44	-2.9
MSFT	119.93	75.50	Microsoft Corp.	87.06	-16.63	-17.6
NETA	37.18	10.06	Network Associates	28.88	-2.50	-8.0
GMH	140.00	48.75	Network General	121.00	1.50	1.3
NOVL	44.56	16.06	Novell Inc.	24.06	-3.38	-12.3
DRCL	90.00	10.50	Oracle Corp.	85.13	5.75	7.2
PMTC	35.93	8.56	Parametric Technology Corp. (L)	10.56	-10.19	-49.1
PSFT	27.75	11.50	PeopleSoft Inc.	20.19	1.44	7.7
PIXR	50.62	33.00	Pixar	37.25	0.94	2.6
RATL	105.00	21.87	Rational Software Corp.	75.63	3.63	5.0
RHAT	151.31	7.00	Red Hat Inc.	38.13	-3.50	-8.4
QSFT	98.12	7.00	Quest Software	55.00	-2.63	-4.6
SAP	85.93	24.12	SAP AG	58.50	0.25	0.4
SCUR	29.62	2.25	Secure Computing Corp.	15.88	0.00	0.0
SSW	37.50	18.12	Sterling Software Inc.	34.75	1.63	4.9
SORC	23.43	8.81	Structural Dynamics Research	12.50	-0.88	-6.5
SYBS	31.00	6.40	Sybase Inc.	21.38	0.31	1.5
SYMC	81.62	12.50	Symantec Corp.	65.88	-8.25	-11.1
SNPS	75.62	36.87	Synopsis	45.63	-0.13	-0.3
SCTC	28.37	9.25	Systems & Computer Technology	22.75	1.63	7.7
BAANF	17.81	4.06	The Baan Co. N.V.	5.19	-0.44	-7.8
TIBCO	147.00	5.00	Tibco Software Inc.	79.00	-9.25	-10.5
TSAI	48.12	20.25	Trans. Sys. Arch.	28.38	-0.44	-1.5
VRTS	174.00	13.55	Veritas Software Corp.	122.56	-19.31	-13.6
WINO	66.12	11.25	Wind River Systems Inc.	40.50	-3.25	-7.4

TELECOMMUNICATIONS CARRIERS OFF -0.6%

AT	91.81	55.87	Alltel Corp.	67.00	4.00	6.3
ANOW	31.25	11.18	Andrew Corp.	23.75	0.25	1.1
T	63.00	41.50	AT&T	55.81	-1.63	-2.8
BCE	137.50	44.06	BCE Inc.	123.88	-1.88	-1.5
BEL	69.50	47.37	Bell Atlantic	64.38	1.38	2.2
BLS	51.62	34.93	Bell South (H)	49.63	2.44	5.2
BRW	41.06	16.31	Cincinnati Bell Inc.	33.00	-2.69	-7.5
CMCSK	57.68	28.90	Comcast	40.69	-0.50	-1.2
CQ	37.06	15.37	Comsat Corp.	20.44	0.00	0.0
COX	58.37	32.78	Cox Communications Inc.	49.75	4.00	8.7
GSTRF	53.75	10.50	Globalstar Telecom. Ltd. (L)	13.63	-0.56	-4.0
GTE	78.50	55.81	GTE Corp.	74.88	1.38	1.9
NXTL	165.87	33.00	NexTel Communications	136.25	-13.25	-8.9
SPOT	74.25	26.37	Panamsat	47.13	-0.31	-0.7
QCOM	200.00	15.37	Qualcomm	148.00	-2.75	-1.8
SBC	59.87	34.81	SBC Communications	45.56	3.00	7.0
FON	75.93	42.82	Sprint Corp.	61.00	-1.63	-2.6
TSX	137.00	55.43	Telephone and Data Systems	111.31	1.94	1.8
USW	81.50	51.50	US West	70.50	-1.94	-2.7
VIA	63.31	36.68	Viacom	55.63	2.00	3.7
WCI	66.50	24.00	Winstar Communications Inc.	52.00	-7.13	-12.1
WCOM	64.51	40.62	MCI Worldcom Inc.	42.69	-1.94	-4.3

SERVICES UNCHANGED

ACXM	35.93	14.56	Axiom Corp.	31.06	-0.13	-0.4
ACS	53.00	31.00	Affiliated Computer Servs	37.25	1.13	3.1
AMSY	44.37	19.75	American Mgt. Systems	42.38	2.63	6.6
AUD	55.43	37.37	Automatic Data Processing	51.81	3.31	6.8
BSYS	69.00	41.37	Bisys Group Inc.	64.25	2.50	4.0
CATP	27.00	10.81	Cambridge Technology Ptnrs	13.50	0.13	0.9
CEN	38.06	14.75	Ceridian	21.00	1.50	7.7
CBR	29.81	13.75	Ciber Inc.	19.00	-1.19	-5.9
COO	37.25	15.81	Comdisco	40.19	-2.81	-6.5
CHRX	27.12	9.25	Computer Horizons Corp.	15.00	-1.75	-10.4
CSC	94.93	52.37	Computer Sciences	79.75	3.00	3.9
OST	76.43	51.18	Dst Systems Inc.	69.88	6.25	9.8
EDS	76.68	46.87	Electronic Data Systems	69.00	4.31	6.7
FDC	54.25	38.87	First Data Group	46.00	1.56	3.5
FISV	40.75	24.12	Fiserv	36.75	1.00	2.8
IT	24.93	9.56	Gartner Group	15.44	-1.38	-8.2
KEA	35.00	17.25	Keane	23.50	-1.75	-6.9
NDC	52.06	21.75	National Data	28.31	2.94	11.6
PAYX	54.93	23.56	Paychex Inc.	50.63	-0.81	-1.6
PER	33.62	15.31	Perot Systems Corp.	19.75	0.25	1.3
REGI	9.75	2.68	Renaissance Worldwide	4.38	-0.88	-16.7
REY	33.00	17.75	Reynolds & Reynolds	26.88	0.25	0.9
SFE	99.00	15.85	Safegard Scientifics	57.25	11.69	17.0
SAPE	151.18	23.87	Sapien Corp.	88.56	4.50	5.4
SMS	73.50	35.50	Shared Medical Systems	52.06	1.81	3.6
SOS	40.00	16.87	Sungard Data Systems	36.88	-1.06	-2.8
SYNT	20.93	7.00	Syntel Inc.	19.00	-1.50	-10.3
TECD	44.68	18.00	Tech Oata	34.50	1.50	4.5
TENF	76.87	17.00	TenFold Corp.	56.13	-3.88	-6.5
TSS	20.87	14.12	Total System Services Inc.	17.56	1.88	12.0
TSAI	48.12	20.25	Transaction Sys. Architects	28.38	-0.44	-1.5

NETWORK OFF -3.2%

COMS	119.75	20.00	3Com Corp.	48.75	-8.38	-11.6
ADCT	58.93	17.18	AOC Telecommunications Inc.	51.38	0.25	0.5
ANTC	61.25	19.00	Antec	42.88	-0.88	-2.0
BNYN	40.56	6.25	Banyan Systems Inc.	16.88	0.81	5.1
CS	52.75	7.18	Cabletron Systems	28.88	-0.13	-0.4
CNEBF	8.93	2.87	Call Net Enterprises	4.69	-0.84	-15.3
CSCO	82.00	24.81	Cisco Systems Inc.	73.63	-2.56	-3.4
ECIL	41.75	23.75	ECI Telecom	29.00	1.13	3.7
ENTU	150.00	16.87	Entrust Technologies Inc.	74.88	-8.38	-7.8
HRS	40.62	15.50	Harris Corp.	31.44	-2.75	-8.0
GMH	140.00	48.75	Hughes Electronics/GM	121.00	1.50	1.3
ERICV	105.25	23.75	LM Ericsson	89.13	1.69	1.9
JNPR	312.93	11.33	Juniper Networks Inc.	257.94	7.56	2.8

EXCHN 52-WEEK RANGE APRIL 7 2 PM WK NET CHANGE WK PCT CHANGE

LU	84.18	49.81	Lucent Technologies	80.25	-1.06	-1.7
MAOGF	17.37	1.43	Madge Networks	7.75	-0.63	-7.5
NCDI	9.62	2.56	Network Computing Dev (L)	3.03	-2.13	-41.2
NWK	14.81	7.31	Network Equipment Tech.	10.50	0.50	5.0
NN	39.50	14.00	Newbridge Networks	35.31	2.81	8.7
NOK	233.37	67.68	Nokia Corp.	220.75	6.00	2.8
NT	144.18	30.71	Northern Telecom Ltd.	125.31	1.88	-1.5
PAIR	20.87	8.00	Pairgain Technologies Inc.	19.25	1.06	5.8
PCTL	15.21	3.25	Pictoretel	7.25	-1.81	-20.0
SFA	77.00	12.75	Scientific Atlanta	68.00	5.63	9.0
TLAB	77.25	45.75	Tellabs Inc.	56.63	-3.25	-5.4
USW	81.50	51.50	US West	70.50	-1.94	-2.7
VRKL	22.00	1.81	Verilink	12.88	1.63	14.4
WSTL	40.75	3.87	Westell Technology Inc.	30.00	-0.81	-2.6

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ADVANCES UNLIMITED	62	CANADIAN NATIONAL RAILWAY CO.	24
AETNA INC.	1	CARRINGTON, COLEMAN	76
AGA GAS INC.	84,86	SLOMAN & BLUMENTHAL LLP	109
AKAMAI TECHNOLOGIES INC.	15	CDNOW INC.	48
ALCOA BUILDING PRODUCTS INC.	8	CENOSIS INC.	90
ALLAMERICA FINANCIAL CORP.	40	CENTIGRAM COMMUNICATIONS CORP.	76
AMAZON.COM INC.	16,94	CISCO SYSTEMS INC.	8,66
AMERICAN AIRLINES	4,8	CNET NETWORKS INC.	50
AMERICAN EXPRESS CO.	26,64	COLOWATER CREEK INC.	1
AMERICAN FRONTIER FINANCIAL CORP.	28	COMERGEN TECHNOLOGIES INC.	73
AMERICAN PRESIDENT LINES INC.	8	COMMERCE ONE INC.	28
AMERICAN STOCK EXCHANGE	24	COMMUNICATIONS ENHANCEMENT	81
AMR RESEARCH INC.	42	PRODUCTS INC.	20,81,84
ANR PIPELINE CO.	1	COMPAQ COMPUTER CORP.	20,81,84
APACHE CORP.	20	COMPUTER ASSOCIATES	28,78
ARCHIPELAGO LLC	24	INTERNATIONAL INC.	84
ARIBA INC.	8,48,109	COMPUTER MEASUREMENT GROUP INC.	84
ARROWPOINT COMMUNICATIONS INC.	88	COMPUTER SCIENCES CORP.	28
ART TECHNOLOGY GROUP INC.	8	CONCERT	33
ARTHUR ANDERSEN CONSULTING	90	CONFERENCE BOARD	66
ASPECT COMMUNICATIONS CORP.	4,28	COREL CORP.	24
AT&T CORP.	6	CRYPTO-RIGHTS FOUNDATION	40
BANC OF AMERICA MARKETPLACE LLC	28	CUTTER CONSORTIUM	12
BANK OF AMERICA CORP.	40	DATA GENERAL	28
BANKOFAMERICA.COM	86	DATAQUEST	12
BEA SYSTEMS INC.	4	DATEK ONLINE	12
BEAUPRES & CO. PUBLIC RELATIONS	4	BROKERAGE SERVICES LLC	28
BELDEN INC.	4	DELAWARE CHANCERY COURT	50
BELL ATLANTIC CORP.	4	OELIA'S INC.	48
BELLSOUTH CORP.	66	DELL COMPUTER CORP.	12
BLUE SKY SOFTWARE	10,28	DELDITTE & TOUCHE LLP.	66
BMC SOFTWARE INC.	62	DEMANTRA INC.	8
BOC GASES INC.	1	DEUTSCHE BANK ALEX. BROWN	82,40
BOISE CASCADE	82,40	DIGITAL ISLAND INC.	
BOFFICE PRODUCTS CORP.			
BOWSTREET SOFTWARE INC.			

DISCOVERMUSIC.COM	84	IMMIGRATION AND	
DOW JONES & CO.	109	NATURALIZATION SERVICE	4
DRKOOP.COM INC.	1	INCHCAPE SHIPPING SERVICES LTD.	88
DRUG EMPORIUM INC.	94	INFORAY INC.	66
EBUILT INC.	84	INRISE CORP.	24
ECIRCLES INC.	8,10,32	INSTINET CORP.	42
ELECTRONIC PRIVACY	84	INTEL CORP.	75
INFORMATION CENTER	24	INTERGRAPH CORP.	88
ELF ATOCHEM	8,42	INTERLINK	84
NORTH AMERICA INC.	8,12,28	COMMUNICATIONS SYSTEMS	24
EMC CORP.	74	INTERNATIONAL	24
ENTERASYS INC.	1	SECURITIES EXCHANGE	64
ERNST & YOUNG'S	109	INTERNET COUNSEL	75
CENTER FOR BUSINESS INNOVATION	26,84	INTERNET MANAGEMENT SERVICES INC.	88
ETOYS INC.	66	INTERWOVEN INC.	50
ETRADE GROUP INC.	12	ITURF INC.	84,86,88
EVENTUS LOGISTICS	43,78	KL INC.	1
EXABYTE CORP.	84	J. C. WILLIAMS GROUP LTD.	75
EXTENDED SYSTEMS INC.	15	JERBOA INC.	28
F5 NETWORKS INC.	40	K-B TOYS	24
FARMERS INSURANCE	64	KOSA CHEMICAL	4,8,24
GROUP OF COMPANIES	12	KPMG CONSULTING LLC	48
FATBRAIN.COM INC.	109	KPMG INTERNATIONAL	62
FEDERAL RESERVE	28	LANDS' END INC.	28
BANK OF NEW YORK	88	LEGATO SYSTEMS INC.	64
FIDELITY INVESTMENTS	48	LERNOUT & HAUSPIE	8
FOOTE PARTNERS LLC	109	SPEECH PRODUCTS INC.	42,94
FORRESTER RESEARCH INC.	88	LOCKHEED MARTIN CORP.	48
FOWLES	110,20,26,28,43	LOGILITY INC.	109
GARTNER GROUP INC.	16	LONDON STOCK EXCHANGE	12
GARTNER INSTITUTE INC.	4,8	LOTUS DEVELOPMENT CORP.	12,78
GATEWAY 2000 INC.	88	LUCAS GROUP	94
GEN3 PARTNERS INC.	50	LYCOS INC.	66
GENERAL MOTORS CORP.	48	MACROMEDIA INC.	107
GEOCITIES	88	MAOISON SECURITIES INC.	109
GERBERTECHNOLOGY INC.	48	MANAGEMENT	109
GIGA INFORMATION GROUP INC.	4,10	RECRUITERS INTERNATIONAL INC.	88
GILLETTE CO.	88	MANHEIM AUCTIONS	58
GLASSBOOK INC.	24,40	MARRIOTT INTERNATIONAL INC.	64
GLOBAL TRAVEL	4	MASTERCARD INTERNATIONAL INC.	64
GREAT PLAINS SOFTWARE INC.	84	MCBRIDE BAKER & COLES	28
GURL.COM	50	MERCATOR SOFTWARE INC.	6
HARBINGER CORP.	28	MERIDIAN RESEARCH INC.	1
HERBERT MINES ASSOCIATES INC.	109	MERRILL LYNCH & CO.	6
HEWITT ASSOCIATES LLC	10	META GROUP INC.	1
HEWLETT-PACKARD CO.	48,81	MICROARTS CORP.	40
HITACHI DATA SYSTEMS	8	MICROSOFT CORP.	1,8,10,12,15,16,20,28,32
HOUSTON STREET EXCHANGE INC.	40		86,75,76,78,81,84,107,110
HUMMER WINBLAO	90	MIGHTYWORDS.COM INC.	40
VENTURE PARTNERS	1	MILLIKEN MILLWORK INC.	1
HUNTER DOUGLAS INC.	48	MOBILE INSIGHTS INC.	8
I2 TECHNOLOGIES INC.	6,16,28,78,81,82	MP3.COM INC.	40
IBM	75	MS2 INC.	90
ICSA LABS	76	MTI TECHNOLOGY CORP.	66
ID SOFTWARE INC.	20	MUZAK LLC	84
IDAHO WASTE SYSTEMS INC.	64	NASA	94
IOENTRUS LLC	42		
IDS SCHEER AG			

NASDAQ STOCK MARKET INC.	12,24,46	SOFTWARE AG	12
NATIONAL SAFETY COUNCIL	20	SOUTH JERSEY MEDICAL SYSTEM	74
NCR CORP.	26	SPRINT PCS GROUP	4
NECK INC.	73	SQUADRON, ELLENOFF	1,15
NET PERCEPTIONS INC.	90	PLESNET & SHEINFELO LLP	33
NETSCAPE	4,16,32,82,88,110	STANFORD BUSINESS SCHOOL	52
COMMUNICATIONS CORP.	76	STAPLES INC.	58,60
NETWORK ASSOCIATES INC.	28	STEVENSON INSTITUTE	58,60
NEW ERA OF NETWORKS INC.	6,24	OF TECHNOLOGY	8,10,48,66,82,84,88
NEW YORK STOCK EXCHANGE	89	SUN MICROSYSTEMS	28
NEXTLINK CORP.	15	SUNTRUST EQUITABLE SECURITIES	78
NIAGARA MOHAWK POWER CORP.	66,76	SUSE INC.	76
NOKIA CORP.	4	SYMANTEC CORP.	89
NORTEL NETWORKS CORP.	66,82	SYNTRA LTD.	15
NOVELL INC.	88	THE ALLERIS GROUP INC.	8
NYPRO INC.	1	THE AMERICAN NATIONAL RED CROSS	52
ONLINE COMPUTER LIBRARY CENTER	4,8,28,43,66,82,88	THE CLIPPER GROUP INC.	52
ORACLE CORP.	1	THE HOME DEPOT INC.	109
OVERSTOCKMARKET INC.	28	THE LANDSTONE GROUP	84
OVUM LTD.	64	THE MOTLEY FOOL	84
PALM INC.	109	THE READER'S	62
PANDA SOFTWARE	88	DIGEST ASSOCIATION INC.	50
PEAPOD INC.	28	THE YANKEE GROUP	50
PEOPLESOFT INC.	64	THEGLOBE.COM	28
PEREGRINE SYSTEMS INC.	109	TIBCO SOFTWARE INC.	12
PHILAIR INC.	4,8	TORONTO STOCK EXCHANGE	81
PRICELINE.COM INC.	76	TOSHIBA AMERICA INC.	84
PRICEWATERHOUSECOOPERS	86	TOYSMART.COM INC.	73
PROFLOWERS.COM	50	TRAEACCESS INC.	66
PROJECTRUFFLE.COM	74	TRANZACT PAYMENT SERVICES	66
PRUENTIAL INSURANCE CO.	20	TRANZACT TECHNOLOGIES INC.	109
RECYCLING COUNCIL OF ONTARIO	43	TRAVELOCITY.COM INC.	50
RED HAT INC.	34	TRIPOD INC.	78
REUTERS LTD.	20	TURBOLINUX INC.	109
REYNOLDS METALS CO.	8	U.S. BANKCORP PIPER JAFFRAY INC.	1,109
RUESCH INTERNATIONAL INC.	109	U.S. DEPARTMENT OF JUSTICE	24
SABRE BUSINESS	16,109	UNION PACIFIC RAILROAD	28
TRAVEL SOLUTIONS	16	UNISYS CORP.	1,120
SABRE INC.	75	UNITED COMPANIES FINANCIAL CORP.	4
SABRE LABS	50	UNITED PARCEL	1
SALESAGENT	78	SERVICE OF AMERICA INC.	8
SALON.COM	12	UNITEDHEALTH GROUP CO.	1
SAMSUNG	40	MANAGEMENT CONSULTANTS LLC	8
ELECTRONICS AMERICAN INC.	4	VALUE AMERICA INC.	89
SAP AG	66	VASTERA INC.	28,78
SAP SYSTEMS INTEGRATION AG	33	VERITAS SOFTWARE CORP.	48
SAPIENT CORP.	66	VF CORP.	34
SBC COMMUNICATIONS INC.	88	VIRGINIA GENERAL ASSEMBLY	64
SCHNEIDER LOGISTICS INC.	109	VISA INTERNATIONAL INC.	4
SCHNEIDER NATIONAL INC.	73	VODAFONE AIR TOUCH PLC	66
SEQUOIA SOFTWARE CORP.	33	VOICESTREAM WIRELESS CORP.	50
SGI CAPITAL INC.	12	WEB CROSSING INC.	50
SHELL OIL CO.	12	WETALK NETWORK	4
SIEMENS AG	33	WIRELESS INTERNET	33
SILICON GRAPHICS FEDERAL INC.	40	& MOBILE COMPUTING	50
SILICON GRAPHICS INC.	12	XEROX CORP.	33
SIMON & SCHUSTER INC.	40	YAHOO INC.	50
SOFTGOODSMATRIX.COM	48		

Stock Options Lose Allure

Market woes may hurt dot-com recruiting

BY JAIKUMAR VIJAYAN
AND JULEKHA DASH

The ability of Internet start-ups to attract top-notch technical talent may evaporate if the free fall in dot-com stocks continues much longer.

That hasn't happened yet, analysts and recruiters said last week. But "the current market volatility is giving people some pause," said Gene Manheim, managing director at Herbert Mines Associates Inc., a New York executive placement firm whose clients include Priceline.com Inc. in Stamford, Conn.

E-commerce companies are famous for using stock options to lure technical workers with the hottest skills. "Typically, e-market companies don't pay much, so the stock market component is critical," Manheim said.

Concerns over stock volatility are causing "many to ask really hard questions about these companies and where they are in terms of market capitalization, their ability to raise money, their brand and their competition," he added.

Fueling such concerns are the signs of growing investor impatience with Internet companies — especially consumer-

oriented Web sites — that aren't making profits.

Examples include Peapod Inc. in Skokie, Ill., CDnow Inc. in Fort Washington, Pa., and eToys Inc. in Santa Monica, Calif.; the latter company's stock has fallen from a high of \$86 per share in October to just under \$10 last week.

This reality check is a good thing, said Ashok Kumar, an

analyst at U.S. Bancorp Piper Jaffray Inc. in Minneapolis. "You have such a high [employee] churn rate in the industry... Now maybe there'll be less incentive for people to just keep jumping to the next stock option," he said.

In some cases, employees are leaving dot-coms to return to their former brick-and-mortar employers, said

Jeffrey Heath, president of The Landstone Group, an affiliate of New York-based Management Recruiters International Inc. Often, employers welcome them back because it can be cheaper than hiring and training new employees, he said.

As more Web sites lose money and workers realize that dot-com life means grueling

hours, "people are starting to realize that click-and-mortars are the safe haven," said David Foote, a managing partner at Foote Partners LLC, a New Canaan, Conn.-based workforce consultancy.

Also, many of the larger brick-and-mortar companies are simply getting better at retaining existing employees, by creating dot-com spin-offs or offering more stock options, said Barbara Gomolski, an analyst at Gartner Institute Inc. in Eden Prairie, Minn. ▀

Continued from page 1

Hybrid Retailers

pects 25% of the company's sales to come via the Web. Being able to use the catalog to advertise the Web site while also sending information via e-mail has been a big help in attracting business, he said.

Jim Schanzenbach, chief technology officer at the online operation of Drug Emporium Inc. in Powell, Ohio, said he wasn't surprised or alarmed by the recently publicized financial difficulties of some online-only retailers. The problems, he said, serve to underscore the operational differences between pure dot-com companies and hybrid retailers, which benefit from brand recognition associated with stores.

"We've never spent a dime on advertising," Schanzenbach said. "A lot of those other companies have gotten into trouble by passing money right onto

advertising agencies. We've invested mostly in the site."

James Dion, a retail analyst at Toronto-based J. C. Williams Group Ltd., said the brick-and-mortar retailers he works with are continuing to forge ahead with their online efforts. "They can afford however long it takes for the Web site to become productive," Dion said.

At the same time, he added, many retailers are realizing that doing the Web right is more complex and expensive than they originally expected. For example, synchronizing inventories across multiple retail channels and converting batch-oriented inventory systems to real-time systems are difficult technical challenges for some companies.

"At first, everybody was just interested in getting out there," Dion said. "They thought they'd put up a Web site, people would order, and they'd ship the products. Now, companies are doing a lot more examination and rationalization

[of their plans]."

Meanwhile, opinions vary widely on how the rumblings in the consumer e-commerce world will shake out in the now white-hot business-to-business Internet arena.

Frank Parth, vice president of development at Overstock-market.com, a Long Beach, Calif.-based Internet exchange for distributors, said he already has felt an impact because venture capitalists and other investors are spooked by the online retailers' financial woes.

"We had some leads for angel funding, but they're getting scared off now," Parth said. "They're demanding more detailed information. They want good, thorough business analysis. They want to see not only that you'll be making \$50 million in two years, they want the

project plan that shows exactly how you'll achieve those goals," Parth said.

"All of the emotion is over," he added. "You can no longer stand in front of a group, show them a business plan with dot-com at the end and have money thrown at you."

When Boise Cascade Office Products Corp. in Itasca, Ill., built its site three years ago, it took a conservative approach, targeting the corporate customers that compose its core business.

"In the beginning, we had to justify every dollar," said Terry Kallen, manager of emerging technologies. "But as more and more customers came on-board, it became apparent we had to spend the money regardless of the [return on investment]. We couldn't risk having computers go down."

Kallen said the site is bringing in \$1 million per day, but just 12% of customers are using it. She said she doubts if more than 75% of customers will ever use the Web site, and "getting to that number will be slow."

John Jordan, an analyst at Ernst & Young's Center for Business Innovation in Cambridge, Mass., sees B-to-B gold in B-to-C red. "The failure of the consumer side of e-commerce could fuel the growth of business-to-business," he said.

"There have been predictions all along that said consumer commerce is just a fraction of the real serious stuff," Jordan said. Failures in the consumer space will work to drive investors to business-to-business ventures all the faster, he predicted. ▀

Sabre Joins Sequoia Portal

BY MICHAEL MEEHAN

Sabre Business Travel Solutions (BTS) today will announce a partnership with Sequoia Software Corp. to create its latest portal-based corporate travel reservation system.

Sabre's goal is to enter middle and small markets by targeting employees directly.

In recent years, Fort Worth, Texas-based travel giant Sabre Inc. has created a few such

portals through its online operation, Travelocity.com Inc., and with business-to-business e-commerce leader Ariba Inc. in Mountain View, Calif.

The deal also will allow corporations to access Sabre via their intranet systems. Such direct travel links can reduce customer costs 15% to 20% by eliminating paperwork and bureaucracy, said Peter Steven, a Sabre vice president.

Sequoia, based in Columbia, Md., plans to create pages that offer the Sabre package along with expense reports, office supply requests and employee benefits information — allowing employees to function as their own business managers.

Josh Walker, a software analyst at Forrester Research Inc. in Cambridge, Mass., said the portal company stands to gain the most as it markets its product to other companies.

"This is huge for Sequoia because Sabre is a monster in this business," Walker said. ▀

Going Broke

All is not well online

CDnow Inc.
Fort Washington, Pa.

- 1999 loss: \$119.2M, up from \$43.9M loss in 1998
- Seeking cash after merger deal with Columbia House Co. fell through

ValueAmerica Inc.
Charlottesville, Va.

- Cut workforce by 47%
- Significantly pared back product line

Peapod Inc.
Skokie, Ill.

- CEO resigned after six months, due to poor health
- Capital investment firms pull out of \$120M deal



FRANK HAYES/FRANKLY SPEAKING

The bunk stops here

THE BIGGEST PIECE OF BUNK that pundits were peddling in the wake of Judge Thomas Penfield Jackson's Microsoft verdict was the idea that the decision simply wouldn't have any immediate impact. That notion didn't last long. Inside of 24 hours, the Dow and Nasdaq had dropped 500 points each. By last Wednesday, Microsoft's stock had lost 20% of its value and was still drifting lower. Wall Street analysts were saying Microsoft had finally burst the tech-stock bubble.

Now that's impact.

But the spinheads and blowhards are slicing lots more baloney — and many of 'em clearly haven't even read the decision. How much of it turns out to be true? Not much...

"This case will be tied up in appeals for the next 10 years." Bunk. Last week Jackson said he wants to decide Microsoft's punishment in 60 days and expedite all appeals straight to the Supreme Court. If the Supremes agree, they could be ruling on U.S. vs. Microsoft less than a year from now. Ten years? Try 10 months.

"The appeals court will be much easier on Microsoft than the trial court." Nonsense. Nobody on either the Supreme Court or the D.C. circuit court of appeals has suggested they'll give Microsoft a break. The D.C. circuit did rule in Microsoft's favor on one point of a consent decree. But most of the new verdict against Microsoft is independent of that ruling. A free ride? Forget it.

"If George W. Bush is elected president, he'll tell the Justice Department to leave Microsoft alone and that'll be the end of it." Baloney. Even without Justice, the 19 state attorneys general aren't likely to quit. They discovered they could win without the feds in the tobacco case, and they already smell blood with the Microsoft verdict. Oh, and more than 100 other civil suits have already been filed. This one ain't going away.

"Punishing Microsoft will destroy our high-tech-driven prosperity." Get a life. Users, corporate IT shops and thousands of vendors are all generating the boom. Microsoft is one of them — and after any penalties in this case, Microsoft will still be one of them. Or maybe three of them.

"Consumers weren't harmed. No harm, no foul." Read the decision, spinheads. It says Microsoft broke the law by forcing consumers to pay for

the "free" Internet Explorer browser whether they wanted it or not and arm-twisting other vendors to block new products. If you loved Internet Explorer and didn't want new products from other vendors, you weren't harmed. A lot of other people think they were — and they've filed lawsuits to prove it.

"The judge admitted Netscape wasn't blocked from competing, so there's no case." Yeah, right. Jackson cleared Microsoft's marketing tactics of wrongdoing because Netscape was still able to distribute Navigator. *Just* the marketing tactics got his OK. It's the *rest* of what Microsoft did that was judged illegal.

"The judge ignored specific instructions from the appeals court, so his whole decision will be thrown out." Hogwash. The appeals court threw out one preliminary injunction, based on a single point in a consent decree. Most of the new verdict doesn't depend on that decision. Read it yourself and see.

"The judge just got mad at Bill Gates for lying to him." Wishful thinking. Read the decision.

"Microsoft hasn't really been found guilty until all appeals are exhausted." Are these people on drugs? Microsoft has been found guilty. Now Microsoft will try to convince higher courts that the ver-

dict should be reversed. But unless and until Microsoft can do that, Microsoft is guilty.

Any other claim is just bunk. ▀

Read the
decision,
spinheads.



Hayes, Computerworld's staff columnist, has covered IT for more than 20 years. His e-mail address is frank_hayes@computerworld.com.

SHARK TANK

NETWORK ADMIN Pilot fish sets up passwords to expire after six months. User says she wants to keep her old password. Pilot fish explains the point of changing passwords. User's response: "I've used that password my entire life for everything I've ever had a password for. Even my co-workers at my last job knew my password and used it as a nickname! I can't change it now!"

GOOD, ER, BAD WORK Programmer pilot fish reports to work one morning to find the print spooler hung, no access to the AS/400 and 11 employees standing idle. Boss tells everyone they'll just have to wait a couple hours for the administrator to arrive with the password. Fish decides to give it a shot (under the boss's watchful eye): Username: *sysadmin*. Password: *sysadmin*. He's in. He resets the spooler. Then he promptly gets a reprimand from the boss — for unauthorized access.

CORE COMPETENCY Last July, this IT consulting outfit with six divisions running under individual names in different specialty areas decides to consolidate everything. "One company," "single point of contact," the

usual rah-rah. Eight months later, management decides things were better the old way, sort of. So it's breakup time again — but into totally new groups. Meanwhile, grumbles a pilot fish, this e-commerce specialist "won't buy a T1 line or an enterprise-class server to develop the big e-business projects they want our office to win." (Special bonus: Yeah, they do management consulting, too.)

SOME SILICON VALLEY Pilot fish are snickering that for Intel's new services-hosting data center, Intel's operating system of choice will be Sun's Solaris. But Solaris is so weak on Intel processors, the story goes, Intel might have to install its rival's UltraSparc machines instead of servers built on the home team's CPUs. Sorry, guys — it's a great rumor, but Intel said it would offer both Intel and Sparc servers when it announced the service way back in September.

Sharky's just sorry he made that Wisconsin bet last week. Mail me a fresh fiasco: sharky@computerworld.com. If I print it, you get a Shark shirt. And wade through the pool every day at computerworld.com/sharky.

The 5th Wave



"Come here, quick! I've got a new iMac trick!"

E-mail: richtennant@the5thwave.com

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